Planning Information

Börger Rotary Lobe Pumps
Börger Chopping Technology

07/06

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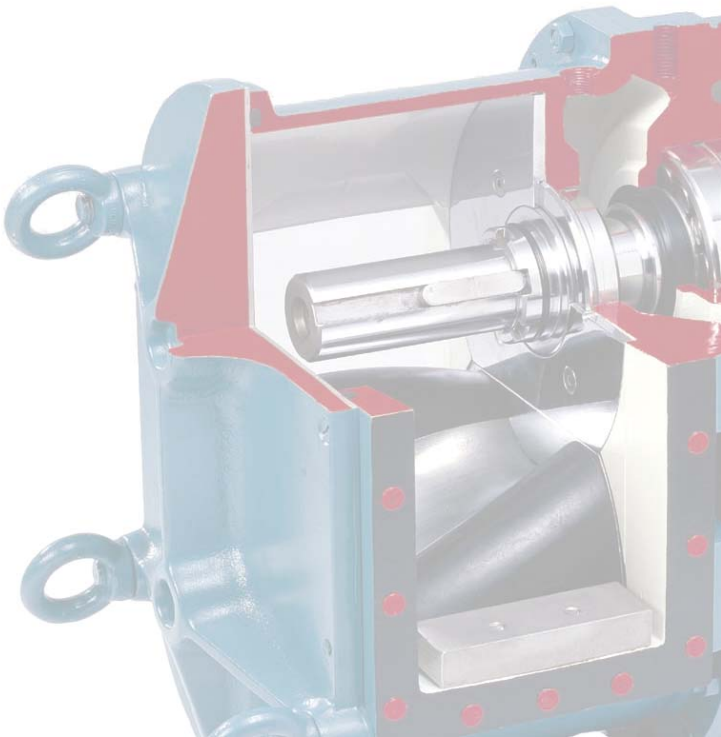
The BÖRGER Rotary Lobe Pump

- Function and Features -

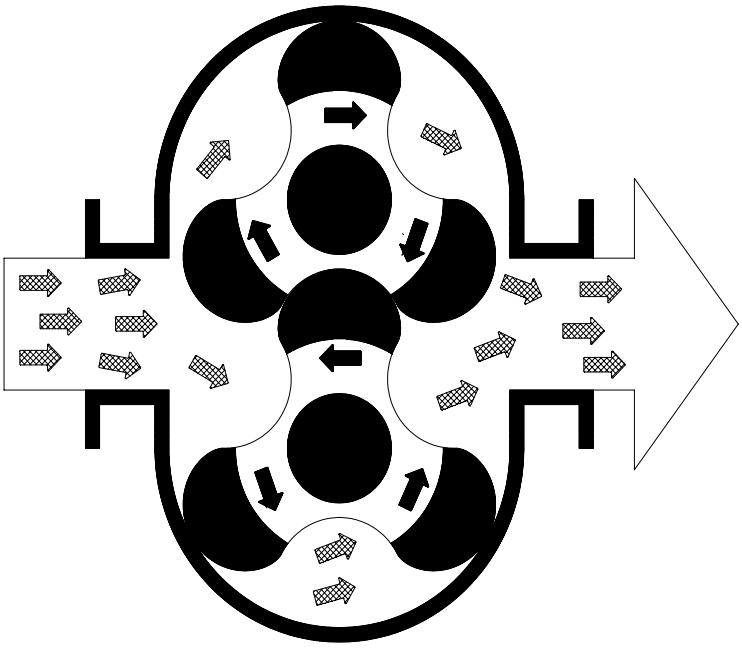


The BOERGER Rotary Lobe Pump

BOERGER Rotary Lobe Pumps are self-priming, valve less, positive displacement pumps. With speed-proportional flow, they continuously deliver trouble-free pumping of liquids of various consistencies and multiphase mixtures. They are compact and operate with low shear and low pulsation.
BOERGER Rotary Lobe Pumps are used for many different applications. They are preferred for sludges and suspensions or where abrasive or shear-sensitive products must be handled.

1. Features

The Function



The parallel, 2-shaft design is common to all Rotary Lobe Pumps. The external synchronizing gear rotates the shafts in opposite directions.

The displacement rotors are fitted on the shafts within the pump casing. The clearances between the rotors and casing are minimized to completely isolate the suction and pressure areas of the pump.

The rotation of the rotors creates a series of chambers within the pump casing. Product fills the chambers on the suction side and is rotated circumferentially to the pressure side. This produces a uniform flow from the suction to the discharge side with no need of valves. The stress to the fluid is negligible as the product is transported almost free of shear and with little pulsation and acceleration.

Flow Rates

BOERGER Rotary Lobe Pumps are available for flow rates of 0,5 to 1050 m^3/h (2 to 4600 USGPM). From 16 different pumps sizes we can select the most suitable pump to meet our customer's specification.

Direction of Flow

The absolute symmetrical design allows reversible flow under any operating conditions by simply changing the direction of rotation of the conveying elements. This allows filling and emptying of a tank with just one pump system.

The accurate Flow

The large direct inlet opening ensures an easy entrance of high viscosity products or liquids with rigid, bulky solids. The product passes a short way through the pump's inner chamber, which results in a very gentle conveying. Even with fibrous and looping particles, any clogging or blockage is almost impossible.

Space Requirement

As a result of their compact but robust design BOERGER Rotary Lobe Pumps can be installed in confined spaces. Various flange configurations and different drive arrangements are designed for the individual local conditions and specific requirements.

The Timing Gear

The rotary lobes on the carrier shafts are synchronized by two spur gear wheels for high operating accuracy to permit a partially dry operation without damaging the rubber coated rotors. The timing gear is in a separately sealed independent unit. High quality gear wheels ensure an even, smooth operation and a long service life.

One side Bearings

The shafts of the Boerger Rotary Lobe Pumps are guided in large dimensioned roller bearings. The bearing assembly is separated from the wetted pump chamber and need not to be disassembled for maintenance purposes.

The Rotary Lobes

The computer controlled manufacturing of the rotary lobes ensures an exact geometry with small tolerances. Suction and pressure side of the pumps are sealed from each other in a reliable manner and with perfect conditions, a suction height up to 20 ft. can be achieved.
The elastomer coating is compatible with the chemical and physical properties of the pumped fluids. Various materials are available, such as wear-resistant elastomers or plastics. Stainless steel rotors can be provided, too. For extremely abrasive conveying products, BOERGER offers readjustable rotors.

The BLOCK Pump Casing

The pump casing is made from a single casting, with small tolerances. It is available from high quality grey cast iron, ductile iron or stainless steel. Both axial faces have replaceable liners. Optional radial liners can also be supplied to reduce the wear and the spare part costs. The pump casing can be surface-hardened to make it more wear resistant. The wetted casing is closed by a quick-release-cover, fixed and tightened by four ring nuts only, to allow a quick access to the interior.

The Ease of Maintenance

MIP = Maintenance in Place. The BOERGER pump design with its one-side bearing arrangement allows for quick direct access to the wetted pump chamber. Rotors or rotor tips and all other wear parts can be replaced within minutes, without disassembling the pump or removing the suction or pressure piping. The multi-vane rotors in the CL, FL, and FLA pump models are equipped with elastomer coated pushed-on rotor tips. The customer's personnel can perform maintenance easily and quickly, which reduces downtime and maintenance costs to a minimum.

The Seals

High quality mechanical seals (e.g. SiSiC) seal the pump shafts. As an alternative to the standard mechanical seals, we can supply double acting mechanical seals, with glandpackings or with special seal systems like the MULTI-SEAL K. In all cases the design and the selected materials are compatible with the specific application.

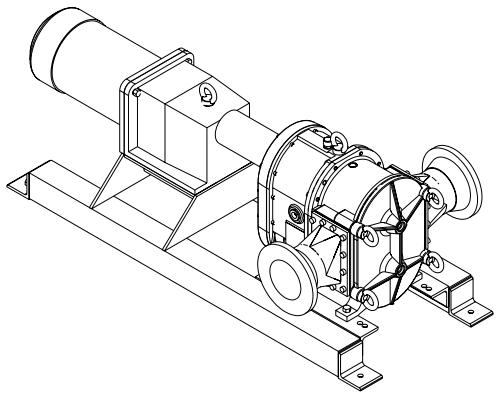
The Fluid-filled Intermediate Chamber

A intermediate chamber - fluid-filled as standard - is located between the pumping chamber and the timing gear. The purpose of this chamber is to prevent product penetration into the timing gear in the event of a seal failure and to provide an indication of the seal failure. The fluid quenches the mechanical seals and lubricates the rotor-shaft connection to keep it free from any corrosion.

The Drive

Pumps are driven by helical geared motors as standard. If required, we are also able to supply variable speed geared motors, combustion engines and hydraulic or pneumatic-motors. Even submersible motors are possible. Pump and drive are connected via an elastic coupling and fitted on a common torsion rigid base frame.

The advantages in overview



- **powerful**
- **speed proportional flow**
- **self-priming**
- **pressure up to 12 bar (175 PSI)**
- **short, direct passage**
- **gentle handling**
- **easy maintenance with MIP**

- Numerous of pump ranges enable an **exact adaptation** to individual application.
- Due to the symmetrical design, the direction of flow is **completely reversible** by simply switching the direction of rotation.
- The large **direct inlet opening** ensures an easy entrance of high viscosity products or liquids with rigid, bulky solids.
- The product passes a short way through the pump's inner chamber, which results in a very **gentle conveying.**
- Even with fibrous and looping particles, any **clogging** or blockage is almost **impossible**.
- Only the pump casing, the rotors and the shaft seals are in contact with the product to be pumped. The other pump elements, even the **shafts**, are **non-wetted** by the conveying product.
- The **compact design** allows installation in space-limited situations.
- The quick release cover and the one-side bearing design allows easy access to the operating pump parts without disassembly of the pipe connections or the pump itself. **MIP = Maintenance in Place.**
- The **materials** of all wetted parts are carefully selected to be **compatible** with the chemical and physical properties of the product to be pumped.
- The pushed-on, **quickly changeable rotor tips** of the pumps in the CL, FL and FLA ranges guarantee easy maintenance with low costs.

- **Stainless steel rotors** are **available** for all pumps, and some models offer rotors from **PTFE**.

- The **rotors** are **machined via computer control**, which ensures an exact geometry with small tolerances.

- For abrasive products, dual-vane, **readjustable rotors** are available.

- With the helical screw lobe design, **almost pulsation free conveying** is achieved.

- Wear-resistant pump **casing in a one-piece block design** are equipped with axial casing liners as standard and optional radial liners from hard metal or from Silicon Carbide for some specific ranges.

- The carrier- and synchronizing gear is in a separate sealed unit. The strong shafts and hardened gear wheels ensure **high torque** and power transmission.

- The **high quality mechanical seals** are suitable for high-pressure peaks and are **easy to maintain**.

- The **intermediate chamber** in between the synchronizing gear and the pump casing is filled with quench fluid. This fluid prevents any dry running of the mechanical seals and indicates possible seal leakage.

- The overall dimension sheets show the **compact design** with geared motors. For space-limited applications the drive can be fitted over the pump, with v-belt transmission. A complete aggregate for app. 150 m^3/h (660 GPM) requires app. 1 m^2 (10 ft^2) only.

- **Complete pump units** are available with geared motors, variable speed geared motors, submersible drives or hydraulic motors. Even stationary or **mobile units with combustion engines** are available.

- **Unlimited variations and applications**.

Fields of Application

Environmental Technology
Sewage, municipal or industrial, sludge, thin or thickened, dosing of polyelectrolyts, feeding of dewatering devices, lime slurries in flue gas desulphuration, water-oil-mixtures

Chemical Industry
Acids, caustics, mixtures, solvents, fats, oils, pastes, dispersions, emulsions, latex or products containing latex, paints and coatings

Oil Industry
Oil, oil sludge, heavy oil, fuel oil, diesel oil, benzene, kerosene, water-oil-mixtures, emulsions

Building Industry
Mineral sludge, cement slurry, bentonite, drilling emulsion, drilling mud, lime slurry, plaster masses, coatings, de-watering

Paper and Paper
Paper stock, coatings, chemicals, paints, lime milk, wastewater, sewage, caoline suspensions, titanium dioxide

Ceramic Industry
Clay, lime slurries, ceramic slickers, ferric oxide slurries, glazings

Fish and Meat Processing
Train oil, entrails, blood, roe, fish meal slurries, chopped meat, sewage, rinds, fats, bone slurries

Fruit and Vegetables Processing
Pulps, fruit pap, chopped vegetables or fruits, sewage

Marine
Bilge water, leakage water, ballast water, fuel oil, oil sludge, sewage

Starch Production
Wash water, pulps, starch milk, mashes, and syrup

Sugar Industry
Wash water, molasses, calcium carbonate slurries, press water, sewage

Mining
Pit water, flotation sludge, lime slurries

Agriculture
Liquid manure, sewage, animal feeding, food wastes, biogas plants

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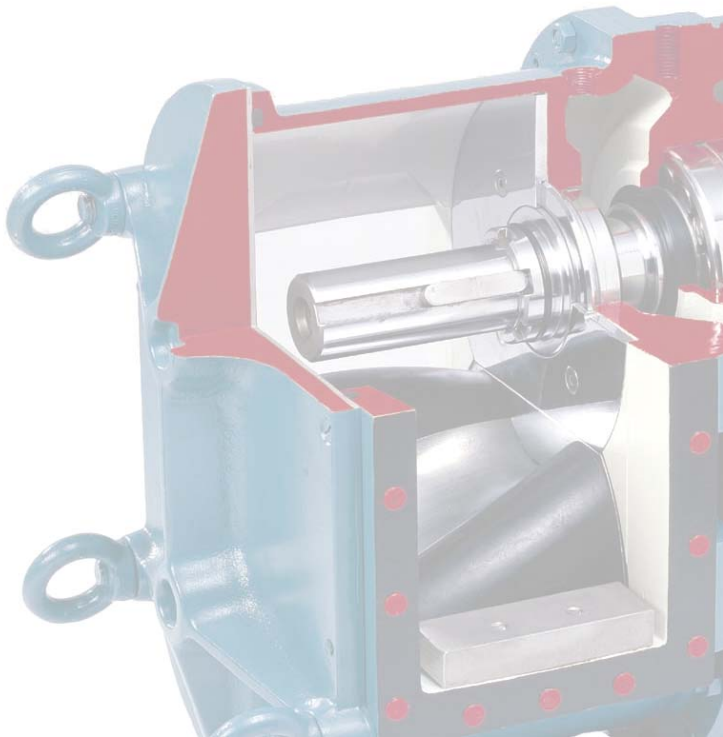
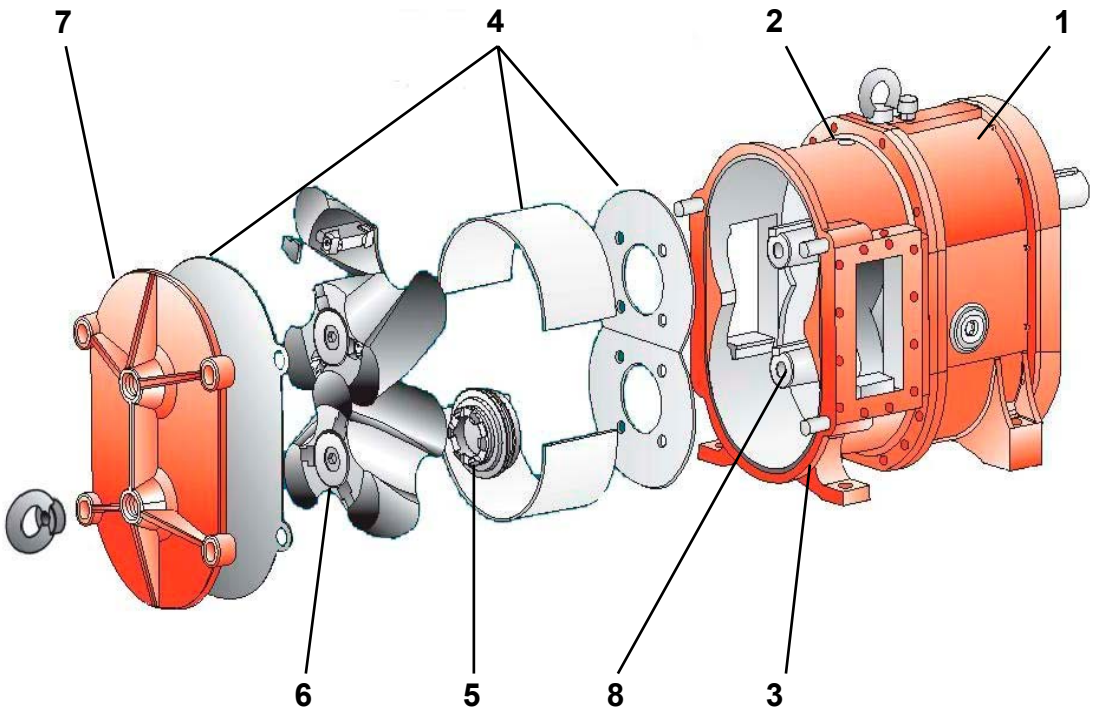
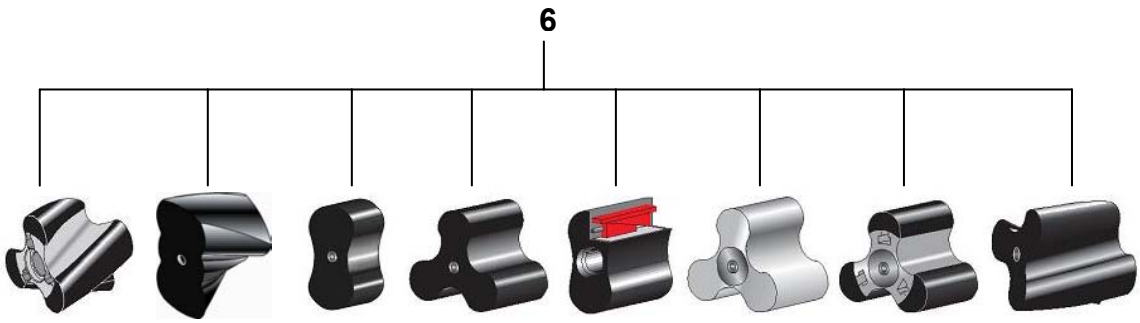
Components of the BÖRGER Rotary Lobe Pump



The Components of the BOERGER Rotary Lobe Pump

1. Bearing and timing gear
2. Intermediate quench chamber
3. Casing in Block design
4. Axial and radial casing liners
5. Shaft seals
6. Rotary Lobes
7. Quick-release-cover
8. Non-wetted shafts

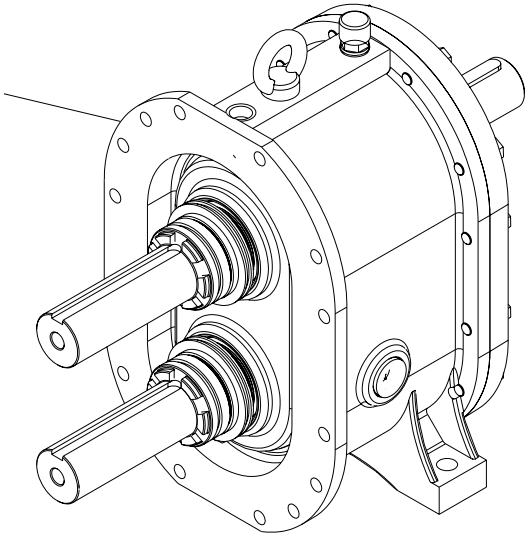




1. Bearing and Timing Gear

The timing gear is in a separately sealed construction element. The high quality and robustly designed gear wheel ensure a precise transmission and long service life.

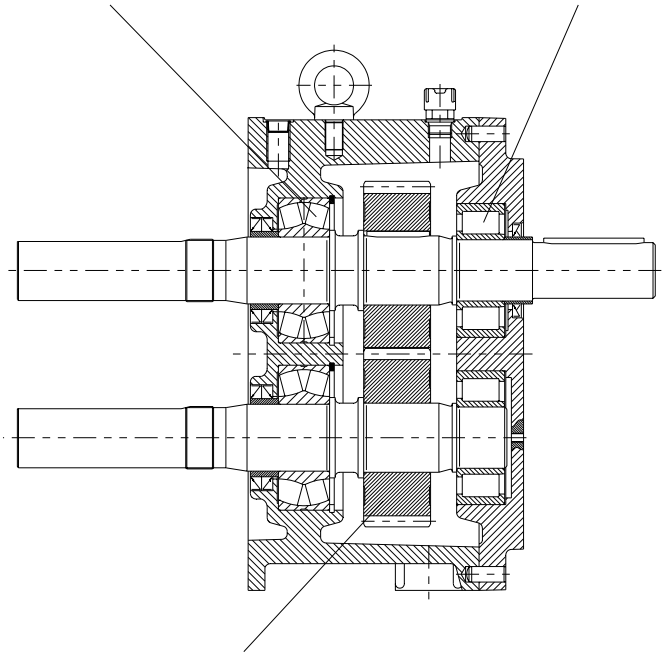
BLOCK-casing, machined with small tolerances



High quality low-friction bearings guarantee high load capacity and long service life

Oversized self-aligning bearing, axially fixed

Cylinder roller bearing, permits axial shifts and prevents tensions



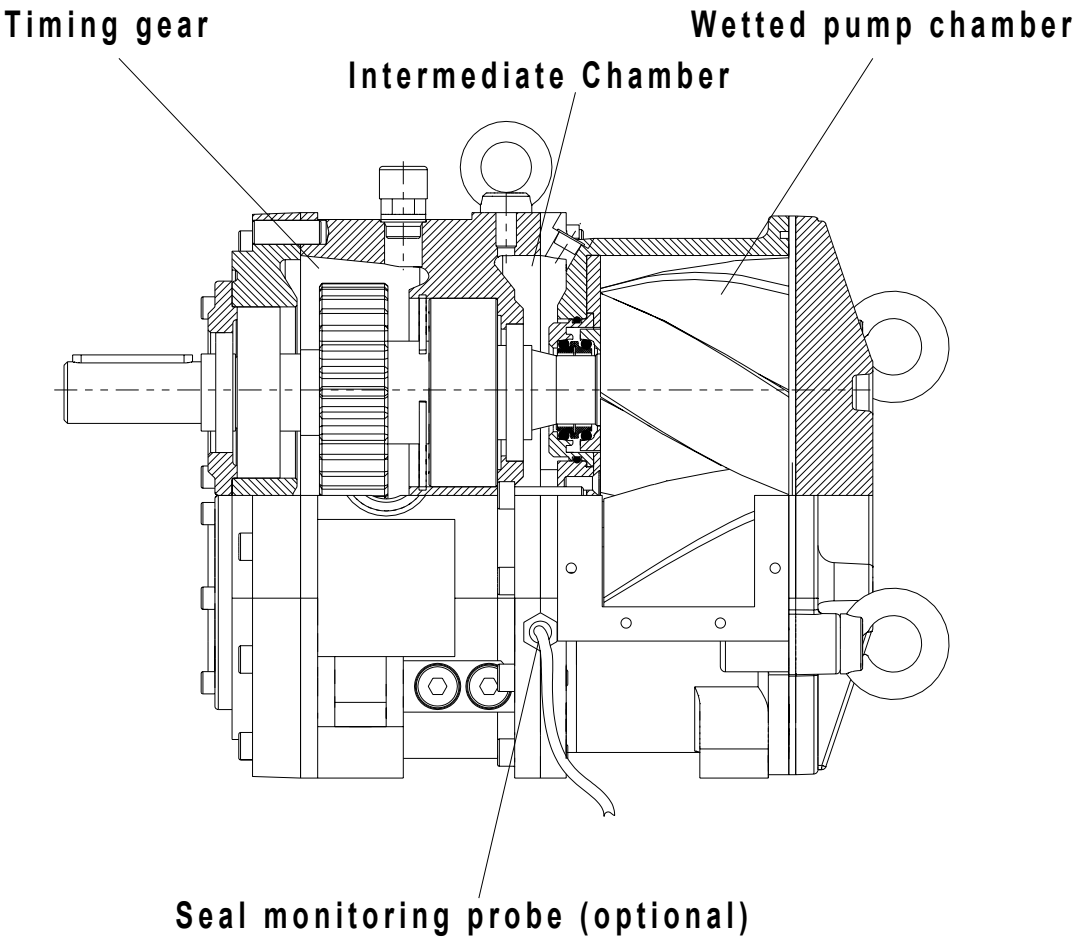
Timing gear with precisely made gear wheels for low noise and clearance-free operation

2. Intermediate Chamber

The fluid-filled and separately-sealed intermediate chamber divides the timing gear from the wetted pump chamber. It protects the gear from penetration of conveying liquid and the pump chamber from contact with gear oil. It is also the seal quench.

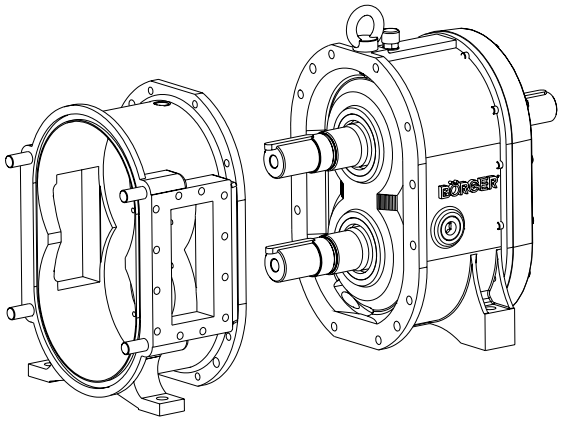
Any seal failures are indicated early by quench fluid overflow.

Upon request we can supply a seal monitoring system, which supervises any seal leakage via a conductivity probe.



3. BLOCK-Pump casing

The wetted pump casing is made from a single BLOCK-casing with low tolerances. It is available from high quality grey cast iron, ductile iron or stainless steel. A quick release cover fitted with just four ring nuts closes the casing.
This allows an easy and quick access to the inner parts of the pump.

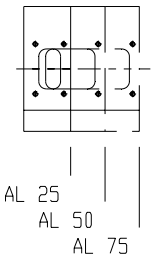


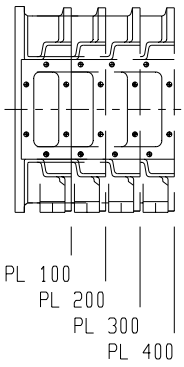
Each pump casing is cast separately in one piece and exactly machined via CNC controlled equipment.

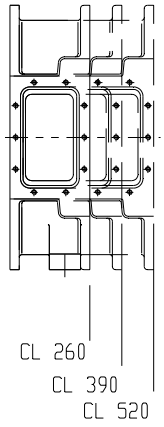
Large direct inlet / outlet openings for continuous flow, even with large solids and high viscosities.

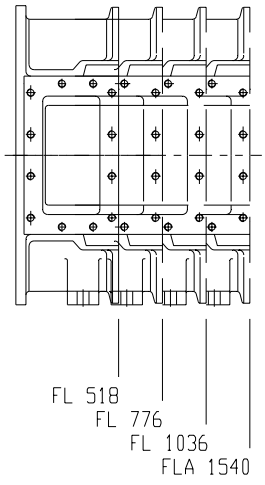
One individual casing length for each pump size.

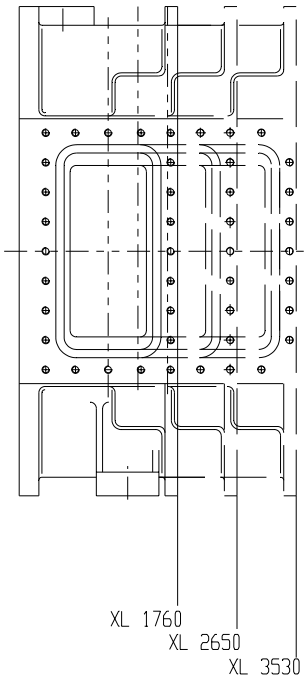
BLOCK C•A•S•I•N•G











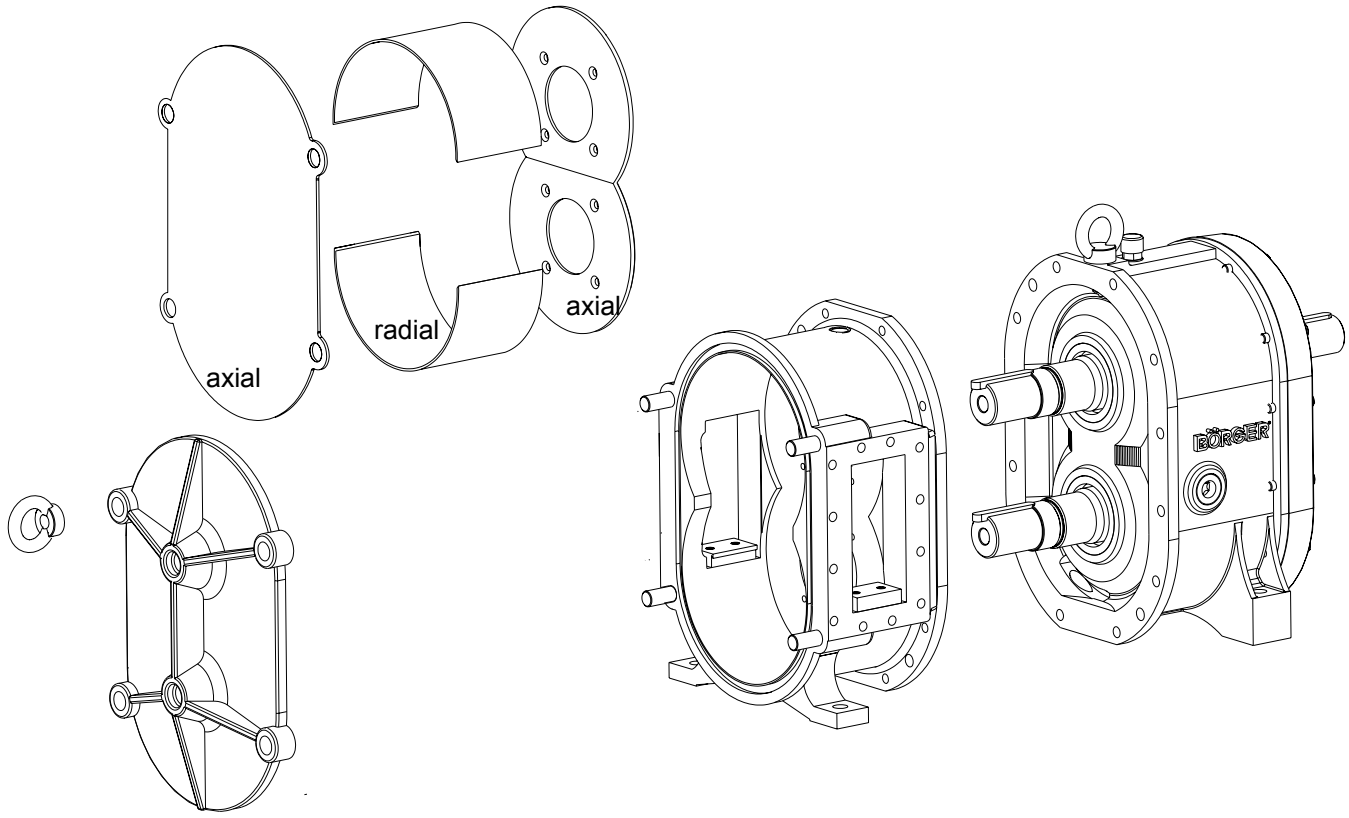
4. Axial and radial casing protection liners

Axial casing protection liners are fitted as standard at both face ends of the wetted pump casing. The liners are made from hard metal, hardened steel or specially treated stainless steel. The front side clamped in liner between the casing face and the quick release cover as well as the screwed-in rear plate is easily accessible because of the quick release cover.

The majority of the BOERGER pump-range can be equipped with additional radial protecting liners made from hardened steel or stainless steel. These **MIP** radial liners are positioned with clamping devices, which are screwed from outside and easily replaced like the axial ones.

When using these liners, all parts without exceptions that are subject to wear are accessible and replaceable through the quick release opening. The pump needs not to be dismantled for inspection or maintenance.

So a consequent **MIP = Maintenance in Place** is ensured.



5. Shaft Seals

Opposite to a lot of other positive displacement pumps, BOERGER Rotary Lobe Pumps have got **single acting mechanical seals with quench** as standard.

These maintenance free shaft seals are available from different materials, adapted to the pumped liquid. Also, the elastomers are selected individually for each application.
The quench as standard ensures a good lubrication of the seal faces, even in case of short term dry running or in vacuum operation. It also prevents sedimentation of product or crystals, which could appear from contact with the atmosphere.

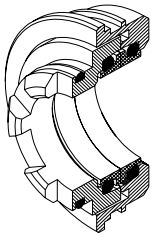
Special designs such as double acting mechanical seals are available upon request.

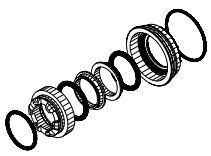
For applications where the use of mechanical seals is not sensible, BOERGER offers pumps with gland packing, with or without a seal gage ring for flush or lubrication.

A special innovation is the BOERGER MULTISEAL system, a specially developed radial shaft seal for various sticky or quick hardening conveying products.

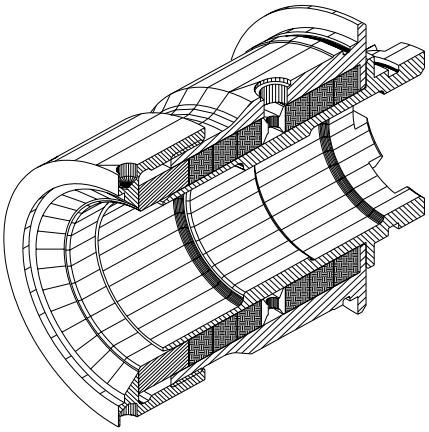
All shaft seals are accessible through the quick release opening and are replaceable as a cartridge unit. So here too: **MIP = Maintenance in Place**

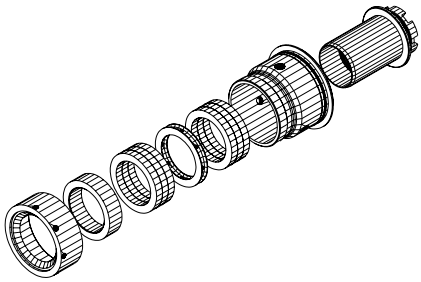
Mechanical Seal



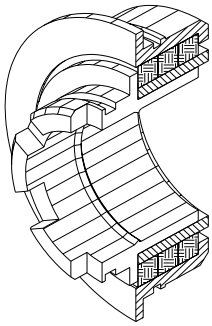


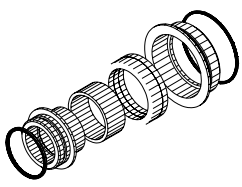
Gland Packing



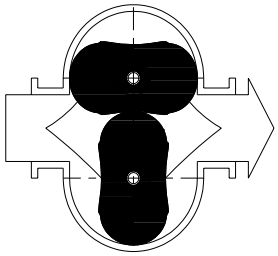


MULTISEAL

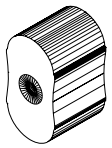




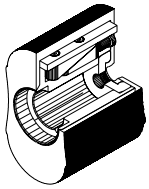
6. Rotors

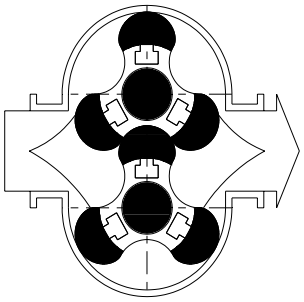


Entirely elastomer coated rotors are preferable for use when conveying aggressive fluids. The metal core and thus the metal-elastomer bonding is not in contact with the pumped liquid. The shape of the coating ensures a seal at the ends of the rotor with the pump casing.

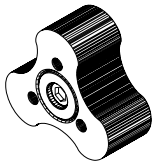


For abrasive products there are **entirely elastomer coated rotors** available in a **re-adjustable** design. In the case of wear the vanes can be readjusted via an integrated mechanism to regain the seal with the surrounding casing and the other rotor.
Patent.

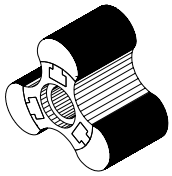


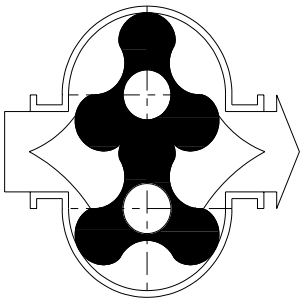


To convey extremely problematic fluids, i.e. solvents, Boerger offers rotors from **stainless steel** or **PTFE**.

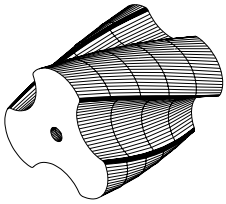


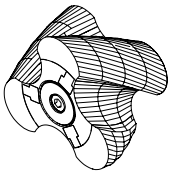
Fluids contaminated with solids are the ideal application for BOERGER **Rotary Lobes with pushed-on, quickly changeable, elastomer coated tips**.
This special maintenance friendly solution is proven especially in large pumps. Spare parts costs and maintenance efforts are reduced dramatically. The rotor base parts are available from ductile iron, stainless steel or special materials.
Patent.



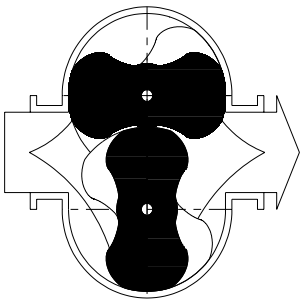


Although Rotary Lobe Pumps generate low pulsations, there are **rotors in helical screw geometry** available for pulsation sensitive applications. With this geometry any pulsation is reduced to a non measurable value. Screw rotors are available in the entirely elastomer-coated design for the PL range only, and **with replaceable tips** for CL, FL and FLA ranges.
Patent.





A real innovation are the new BOERGER **Optimum rotors.** The especially strong designed entirely rubber coated vanes have got the same radius as the pump casing. This screwed form results in a large sealing face with multiple longer service life.
Patent.



The rotors are adopted to **each individual pplication**. Beside different metals there are different elastomers, plastics or special materials available. The building kit system ensures that almost all rotors can be fitted to previously supplied pumps.

7. Quick Release Cover

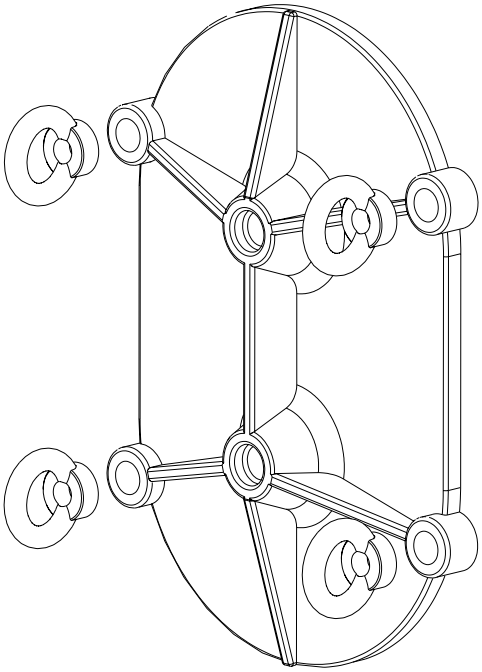
The robust design of BOERGER Rotary Lobe Pumps with one side bearings as a matter of principle allows the quick release cover with the best access possible to all parts being wetted and subject to wear. All of these parts can be easily inspected and simply be replaced if needed.

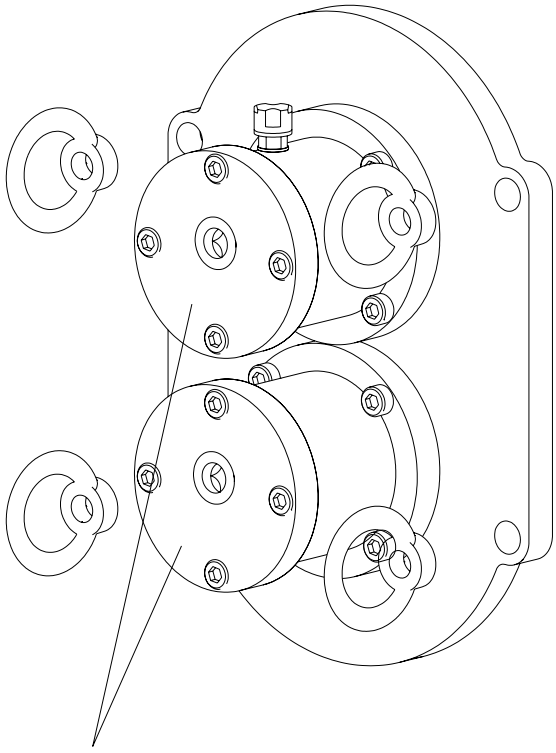
After removing just four ring nuts the quick release cover can be taken off, which makes maintenance easy.
For any replacement of worn parts the pump does not need to be separated from the system. Even the suction and pressure pipe connections remain fitted. There is no need for removable pipe pieces or spacer couplings in connection with BOERGER Rotary Lobe Pumps.

Also for pumps with additional shaft support systems in the quick release cover, the additional bearings are integrated into the cover and can be removed together with it. So the huge maintenance advantage of the one side bearing system remains in existence for these pumps too.

Maintenance friendly in perfection!

MIP = Maintenance in Place





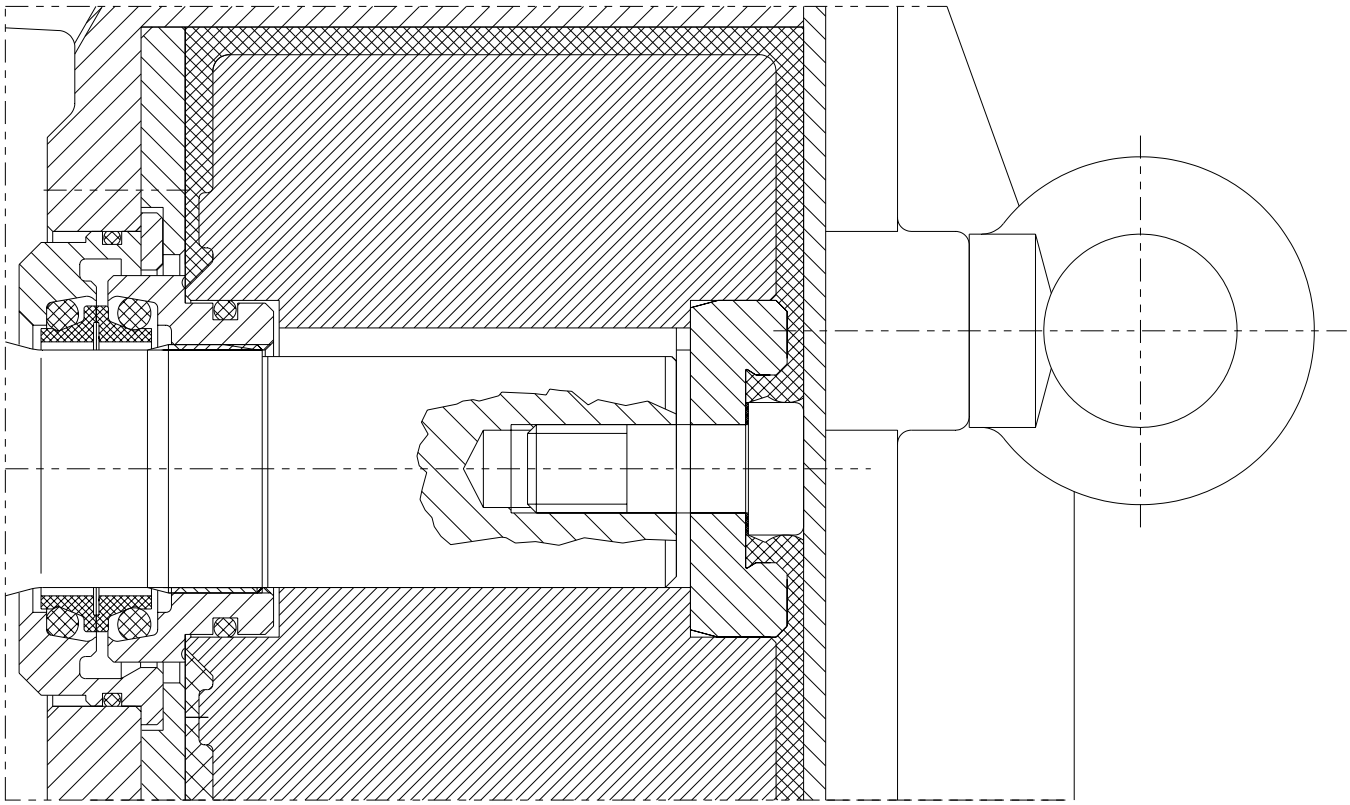
Maintenance free additional shaft support

8. Non-wetted Shafts

The conveying product because of the special self-sealing design does not wet the carrying shafts of BOERGER Rotary Lobe Pumps.

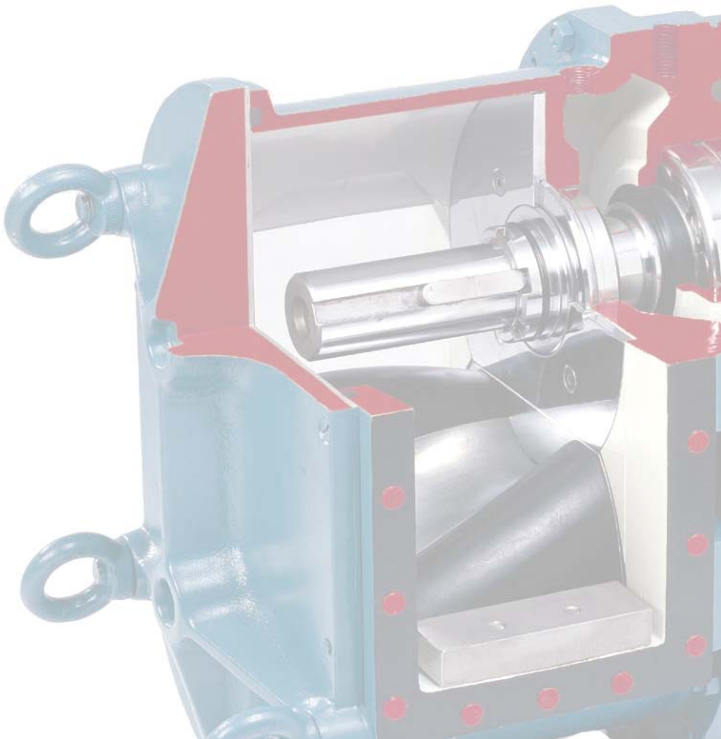
The connection between the rotors and the shafts is continuously wetted by the lubricant liquid from the intermediate chamber and thus protected from corrosion. Even after extended operation, an easy and trouble-free exchange of the rotors is ensured.

The self-sealing design of the entirely elastomer coated rotors prevents any contact of the pumped liquid with the shafts. With all other rotors this is ensured by separate O-rings.

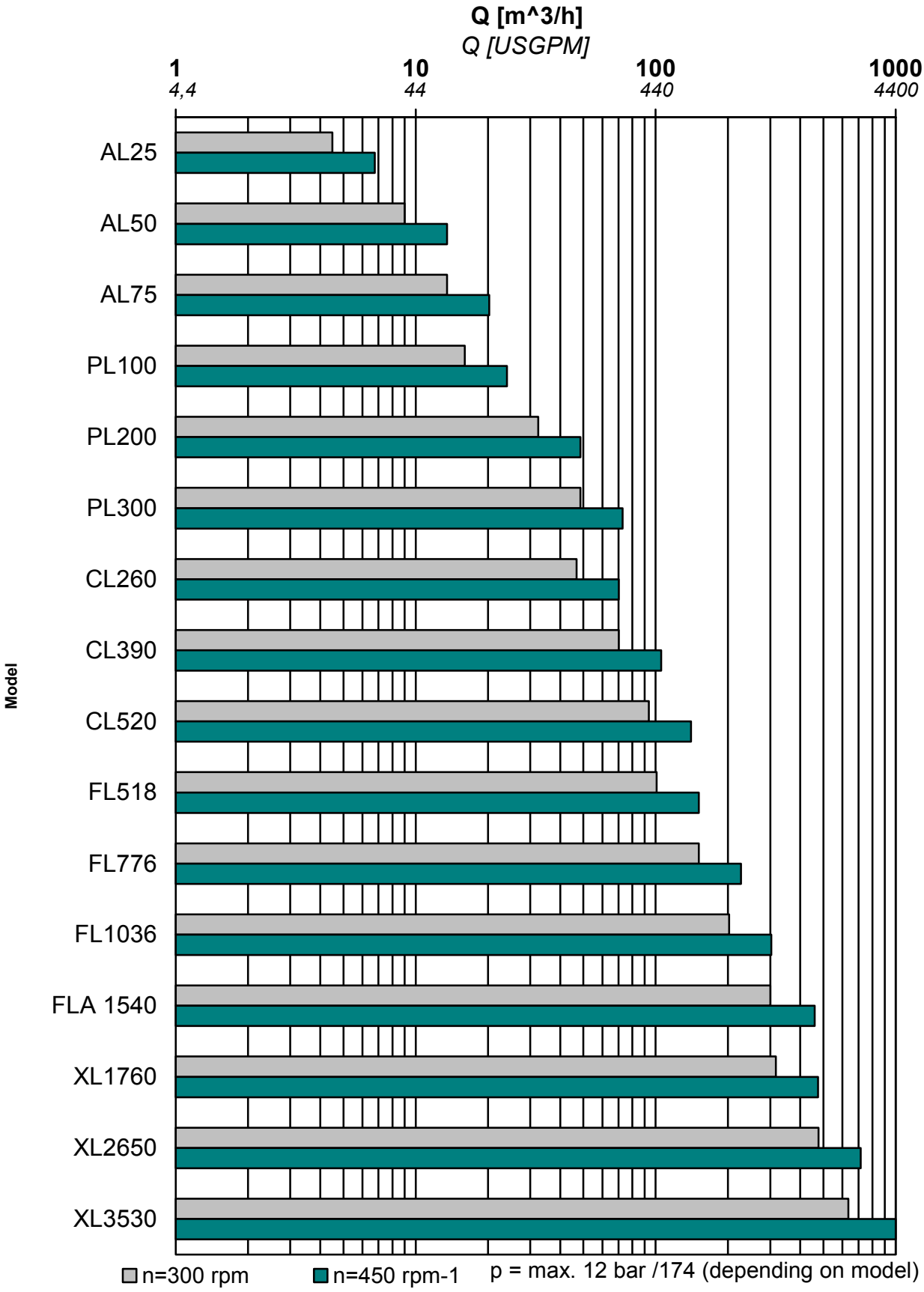


3

Performance Overview



Pump Series Overview of BOERGER Rotary Lobe Pump



BÖRGER

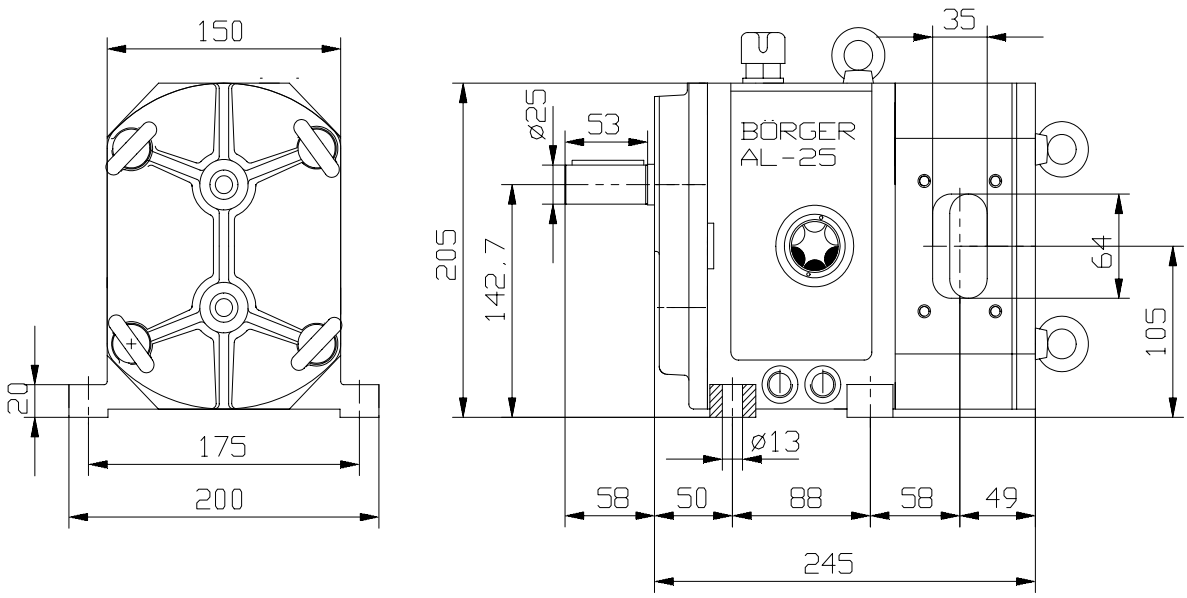
4

AL Series

BÖRGER

AL Series

AL 25

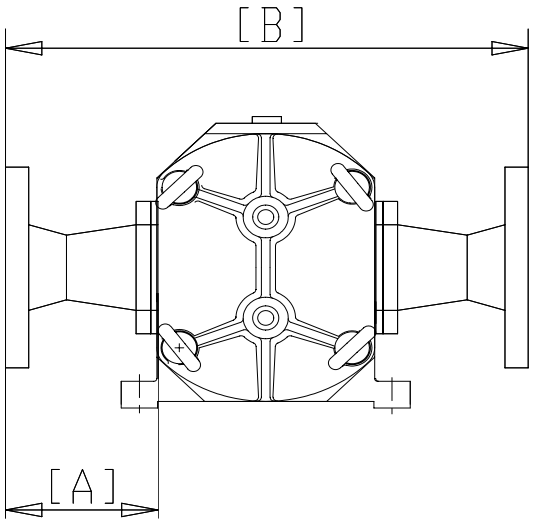


Weight 35,5 kg

Measure above single flange [A] / Measure above flanges [B]

AL 25	DN 32 [mm]	*DN 40 [mm]	DN 50 [mm]	DN 65 [mm]	DN 80 [mm]
DIN 2633	96/350	101/360	116/390	111/380	141/440
ANSI 150	114/384	121/400	135/428	135/428	146/450

* Standard flange

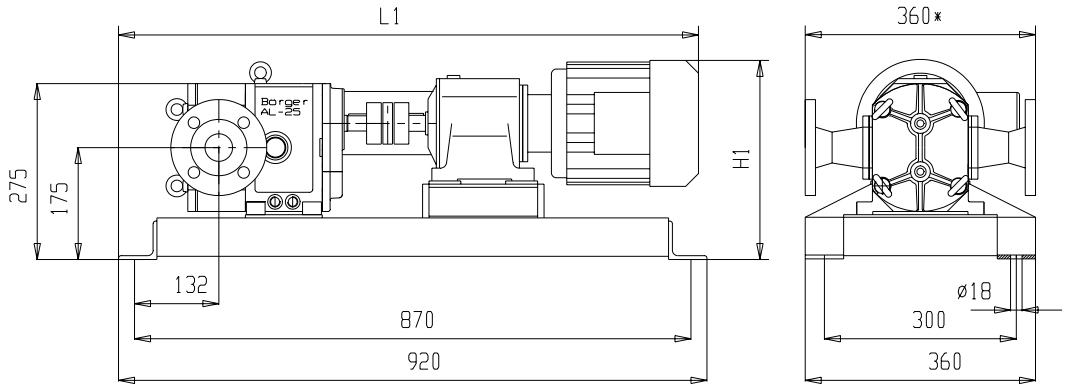


Dimensions may differ due to production reasons!

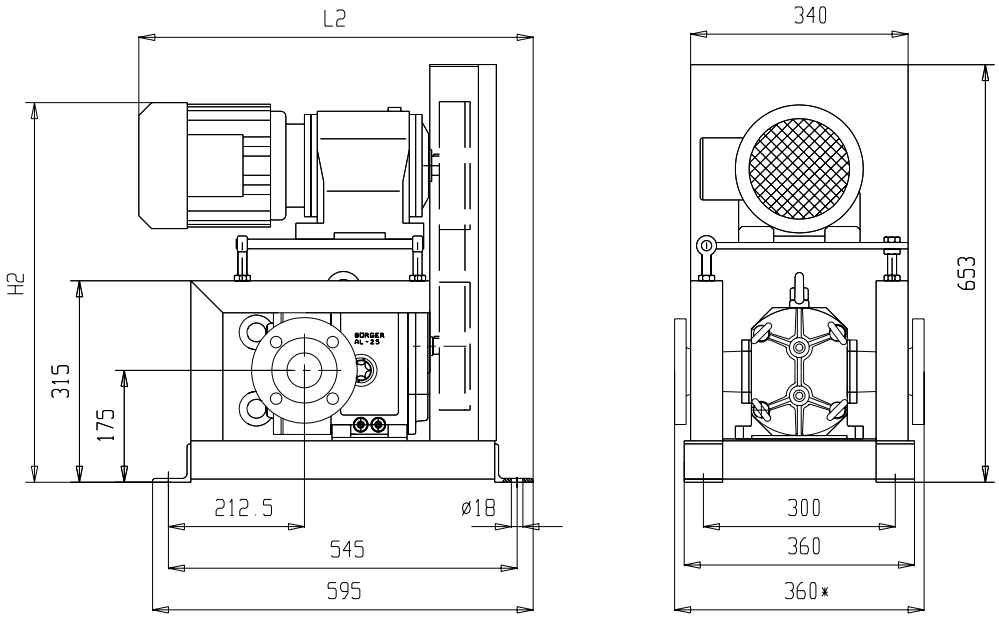
BÖRGER®
AL Series

AL 25

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
1,1	75	780	224	597	581
1,5	79	780	224	597	581
2,2	85	878	245	695	602
3	96	907	245		
4	101	930	257		
5,5	125	1021	276		
7,5	136	1059	276		

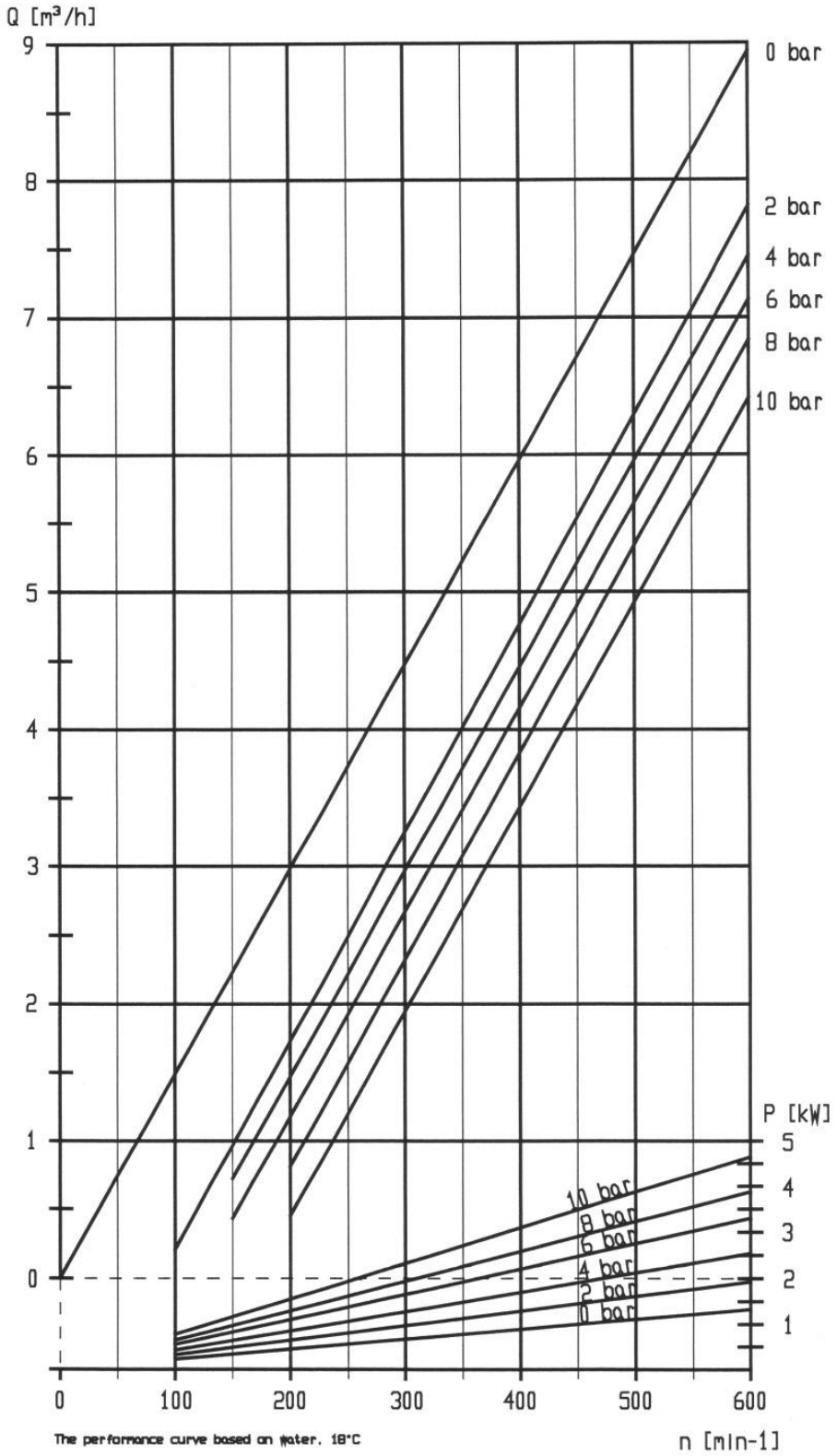
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®

AL 25

performance curve

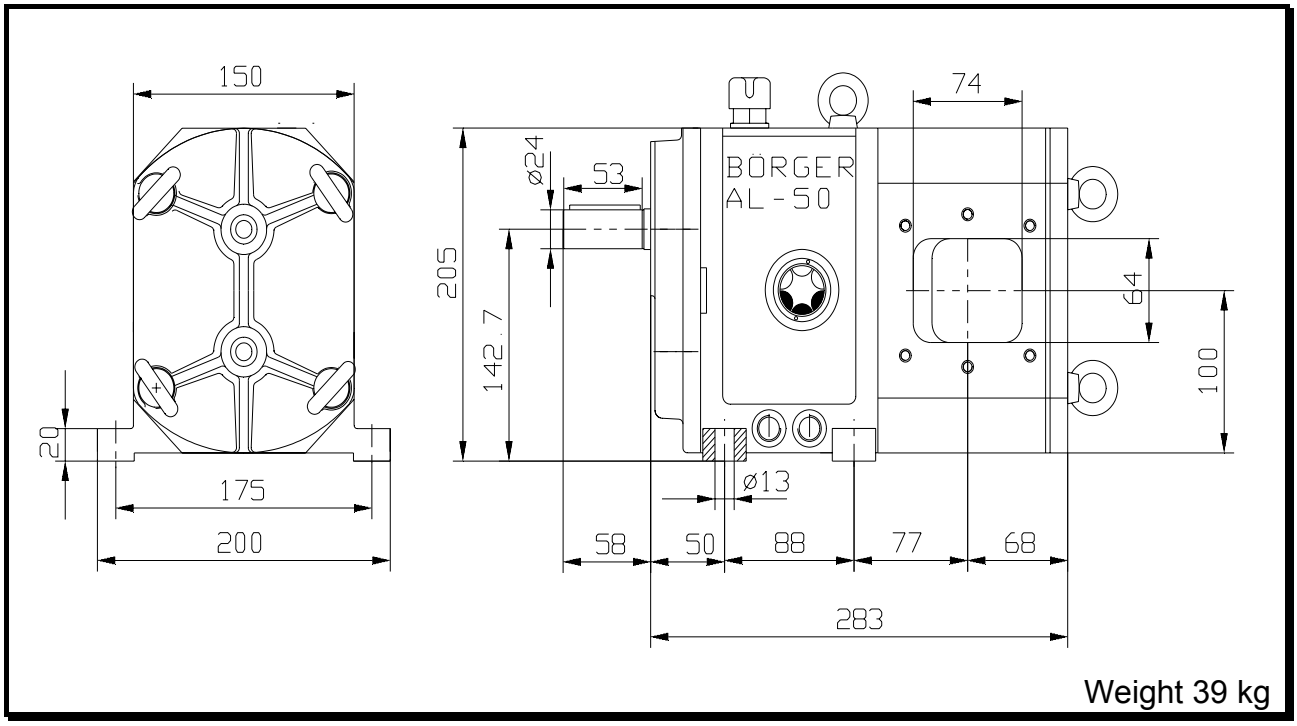


The performance curve based on water, 18°C

BÖRGER®

AL Series

AL 50

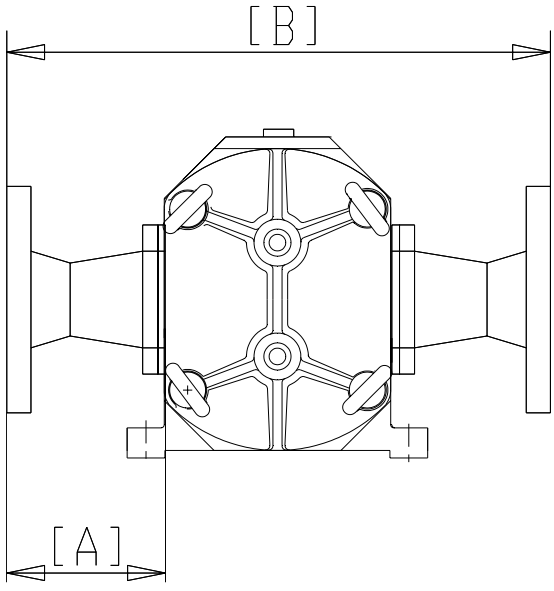


Weight 39 kg

Measure above single flange [A] / Measure above flanges [B]

AL 50	DN 40 [mm]	*DN 50 [mm]	DN 65 [mm]	DN 80 [mm]	DN 100 [mm]
DIN 2633	126/410	121/400	121/400	136/430	141/440
ANSI 150	146/450	140/438	146/450	156/470	165/488

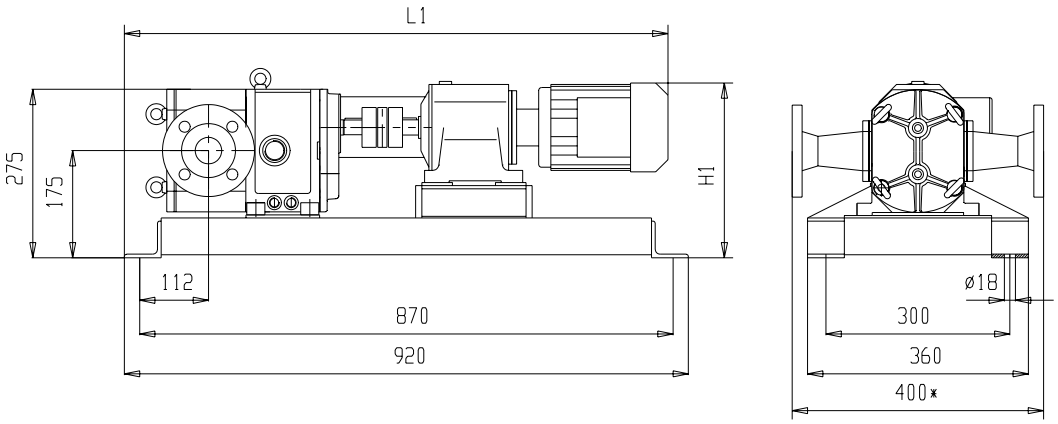
* Standard flange



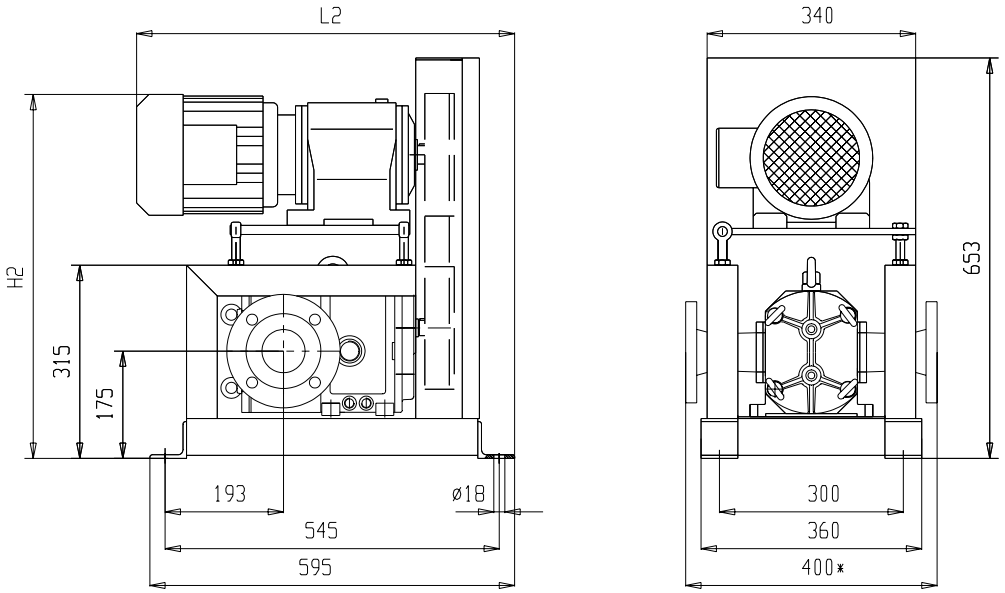
Dimensions may differ due to production reasons!

AL 50

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
1,1	80	818	224	597	581
1,5	84	818	224	597	581
2,2	90	916	245	695	602
3	101	945	245		
4	106	968	257		
5,5	130	1059	276		
7,5	141	1097	276		

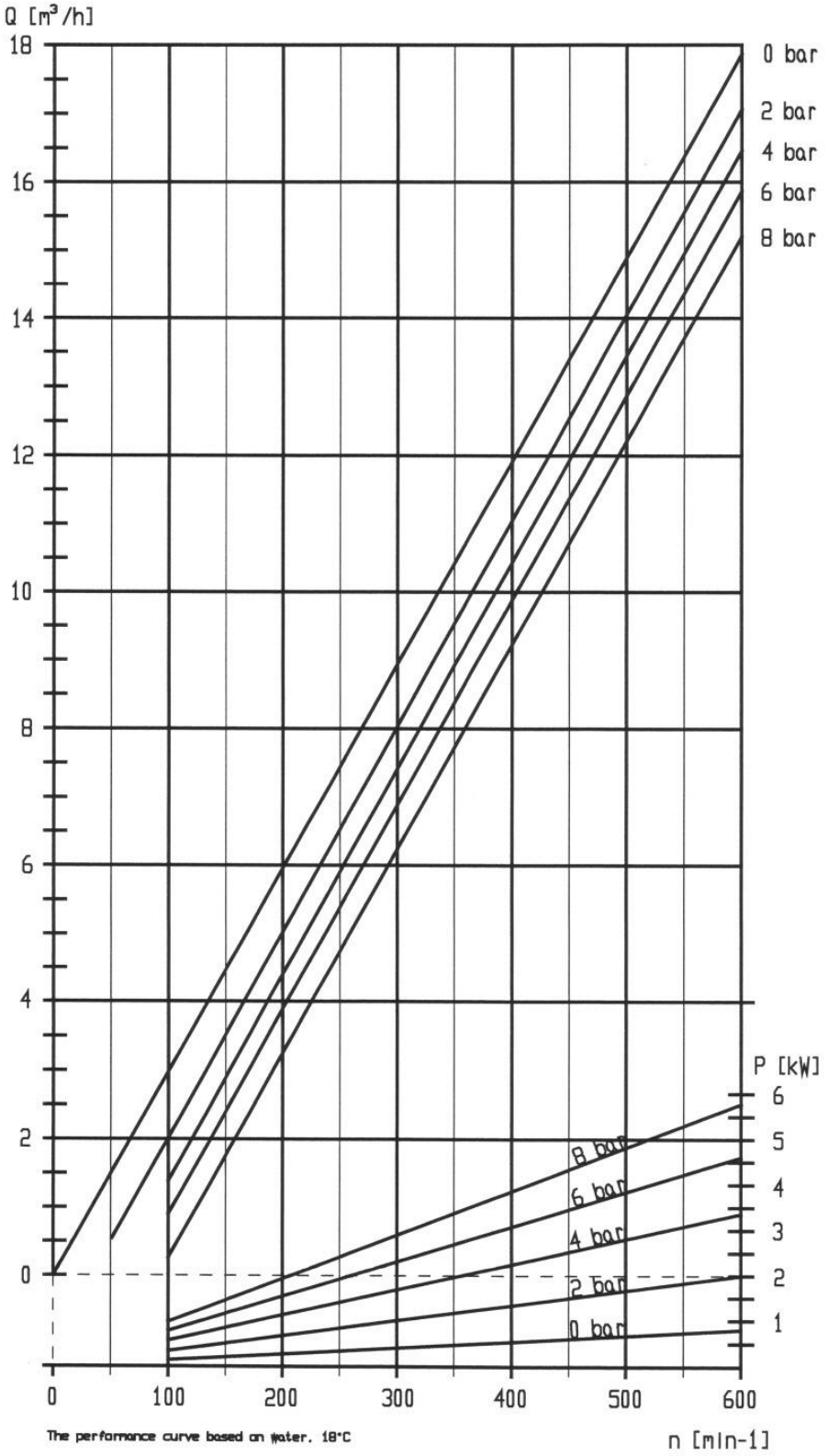
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®

AL 50

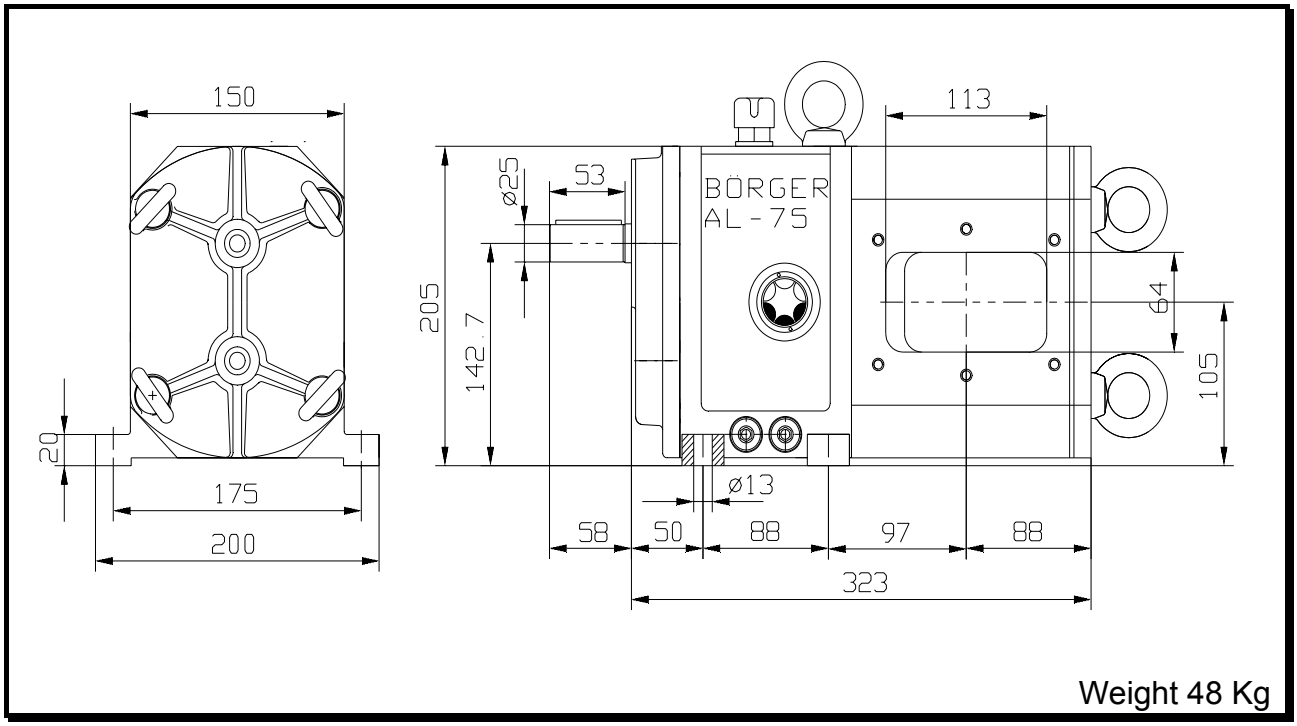
performance curve



The performance curve based on water, 18°C

AL Series

AL 75

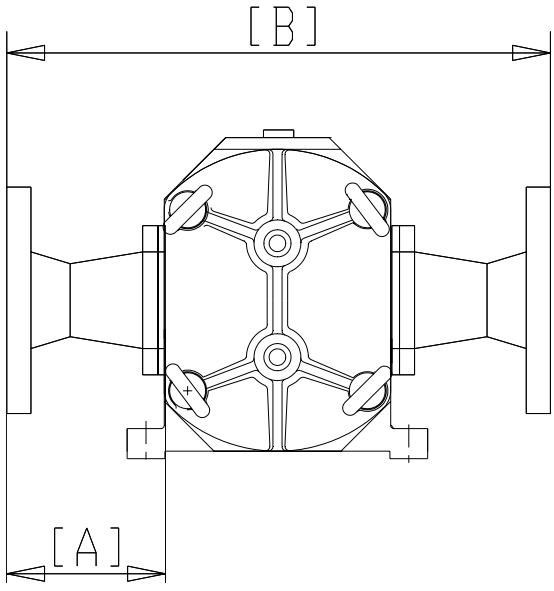


Weight 48 Kg

Measure above single flange [A] / Measure above flanges [B]

AL 75	DN 50 [mm]	*DN 65 [mm]	DN 80 [mm]	DN 100 [mm]
DIN 2633	171/500	141/440	131/420	141/440
ANSI 150	191/538	165/488	151/440	165/488

* Standard flange

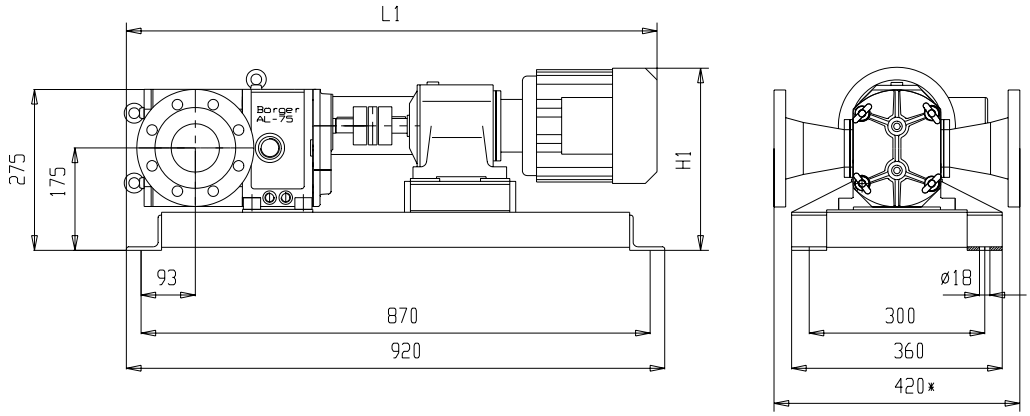


Dimensions may differ due to production reasons!

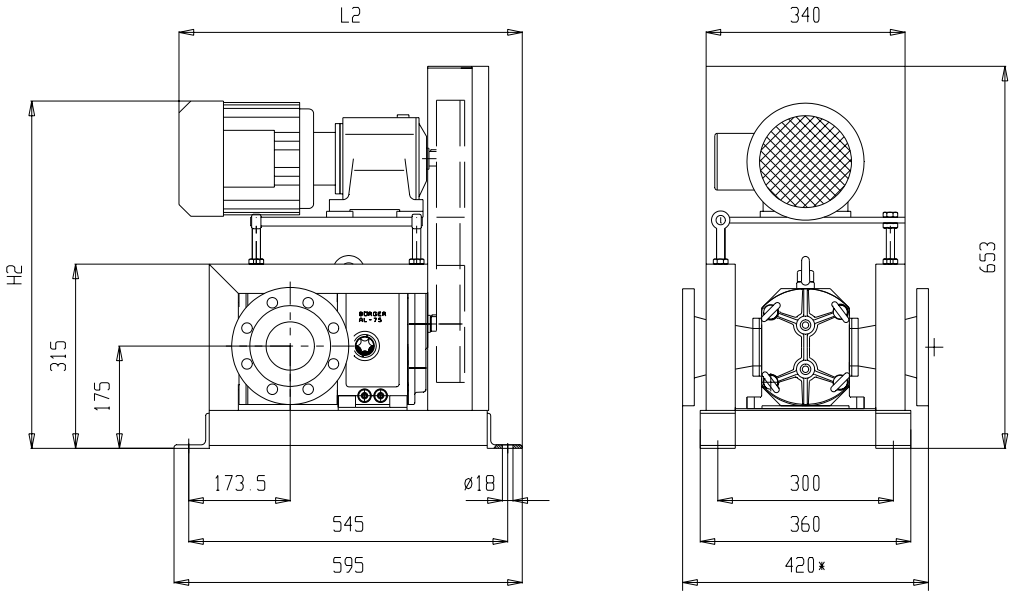
BÖRGER®
AL Series

AL 75

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
1,1	85	858	224	597	581
1,5	89	858	224	597	581
2,2	95	956	245	695	602
3	106	985	245		
4	111	1008	257		
5,5	135	1098	276		
7,5	146	1139	276		

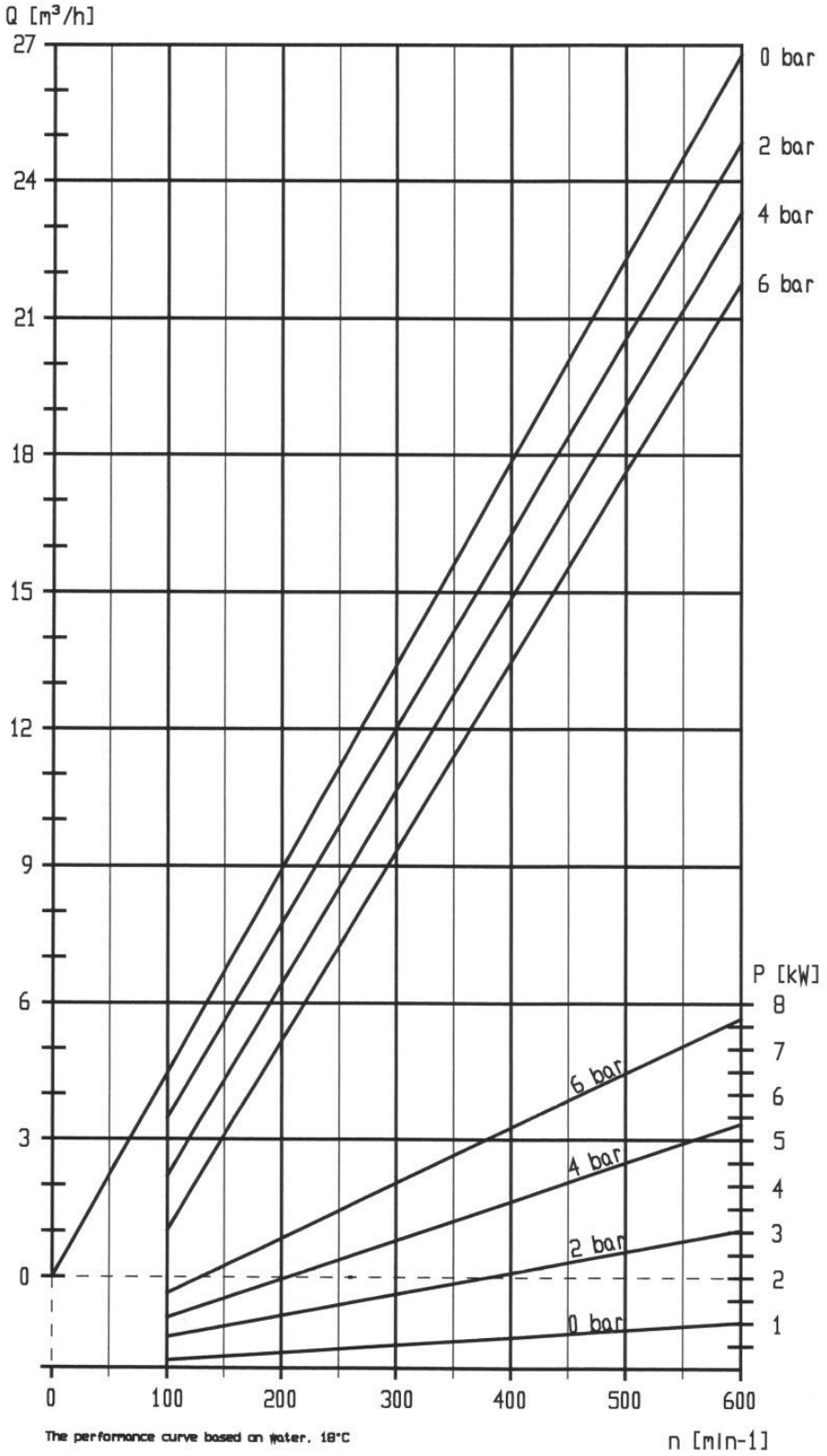
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®

AL 75

performance curve

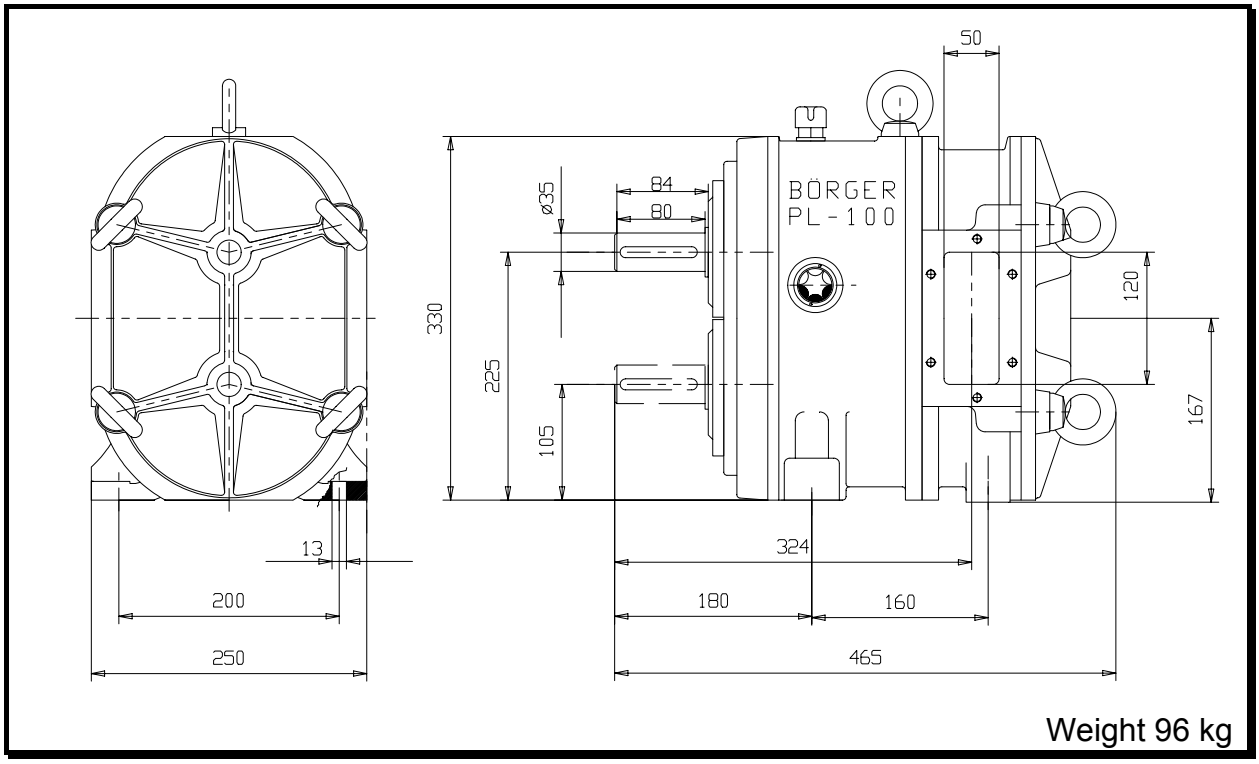


The performance curve based on water, 18°C

5

PL Series

PL 100

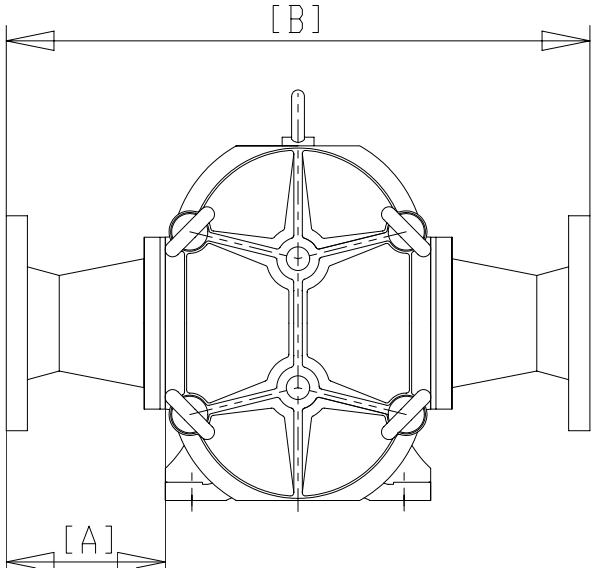


Weight 96 kg

Measure above single flange [A] / Measure above flanges [B]

PL 100	DN 50 [mm]	DN 65 [mm]	*DN 80 [mm]	DN 100 [mm]	DN 125 [mm]
DIN 2633	176/610	141/540	146/550	16/550	176/610
ANSI 150	195/648	166/590	161/580	170/598	210/678

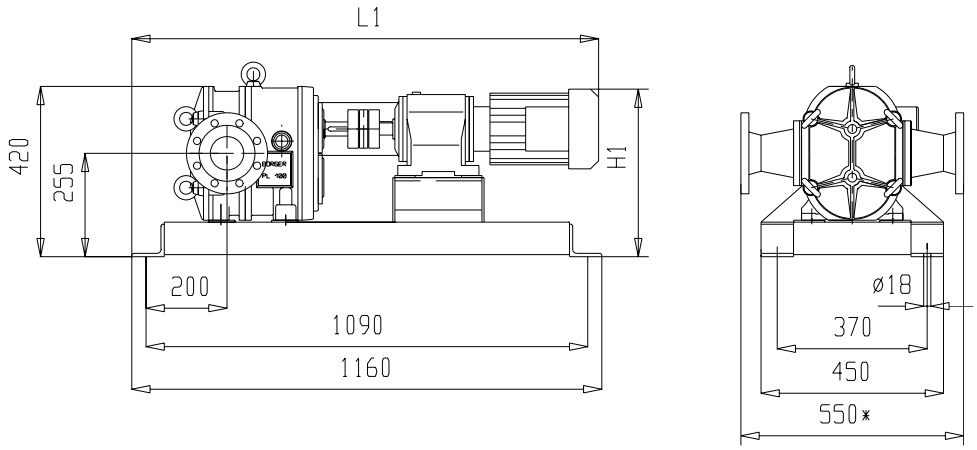
* Standard flange



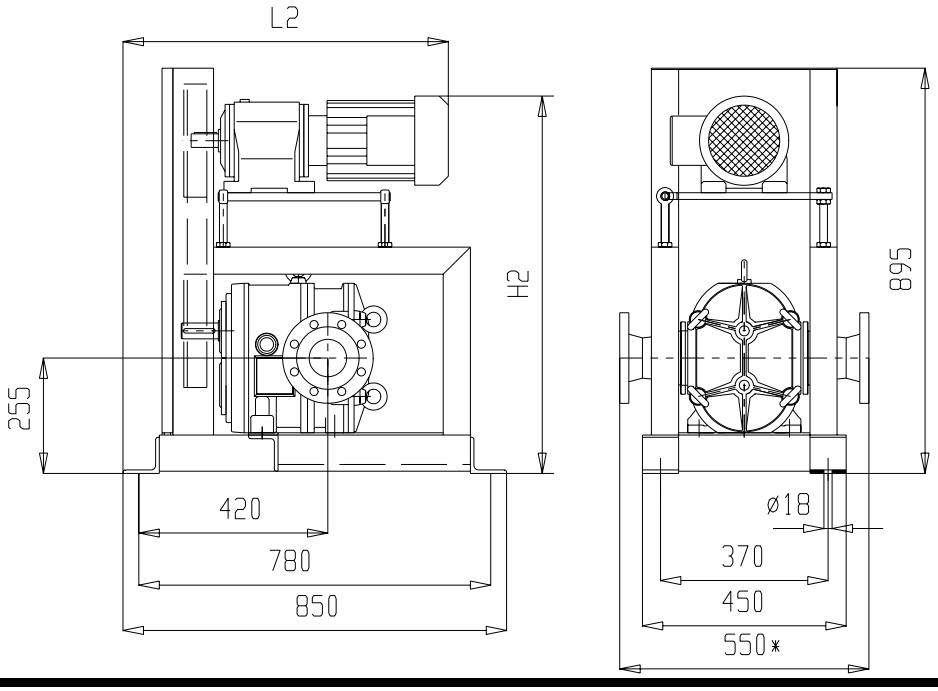
Dimensions may differ due to production reasons!

PL 100

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
1,5	155	1100	414	656	834
2,2	160	1150	414	706	834
3	175	1150	414	706	834
4	190	1176	426	732	846
5,5	200	1233	453	789	846
7,5	245	1295	453	831	873
9,2**	265	295	453		
11**	275	1420	453		
15**	305	1467	481		

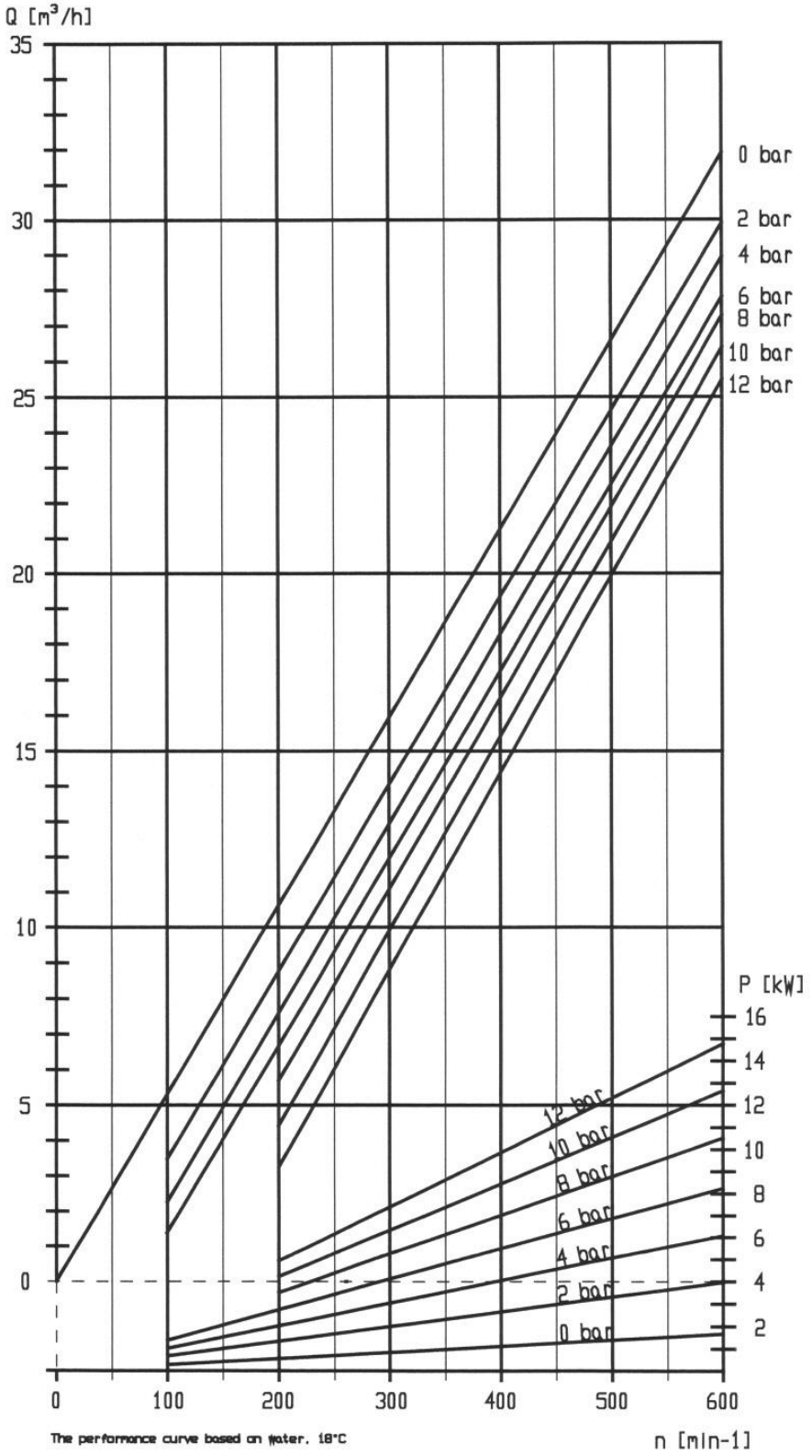
* Standard flange
** not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

BÖRGER®

PL 100

performance curve

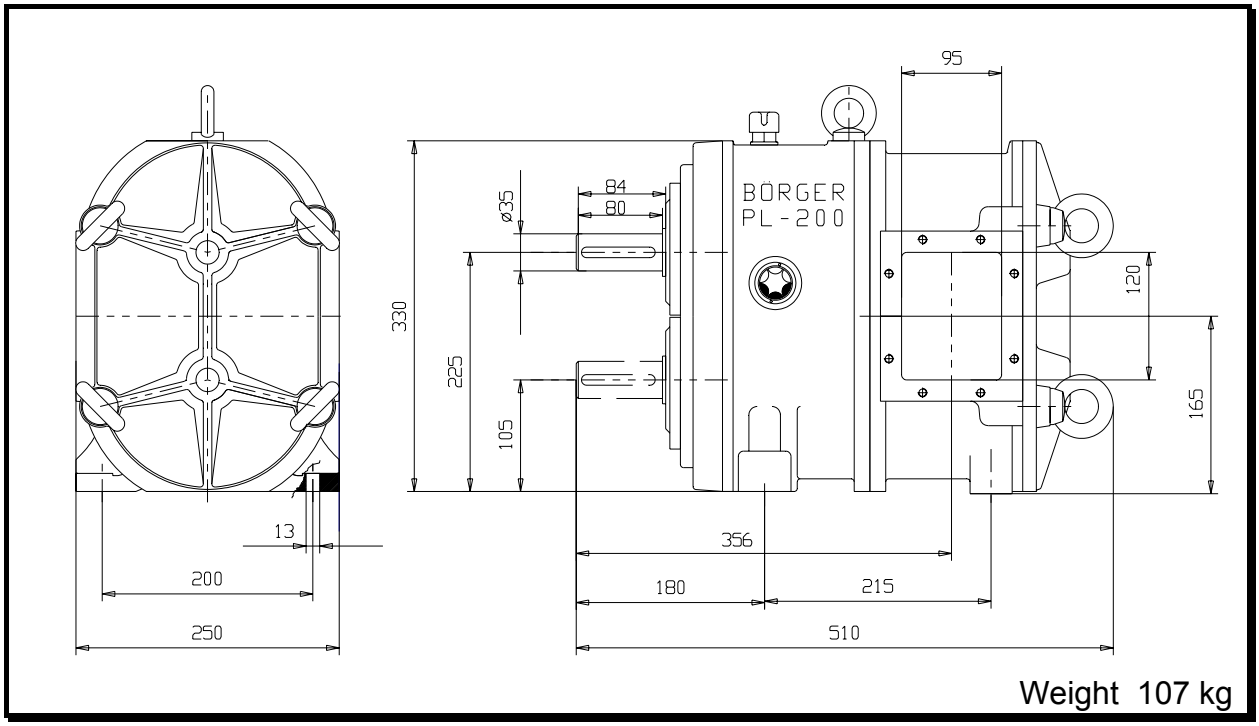


The performance curve based on water, 18°C

BÖRGER

PL Series

PL 200

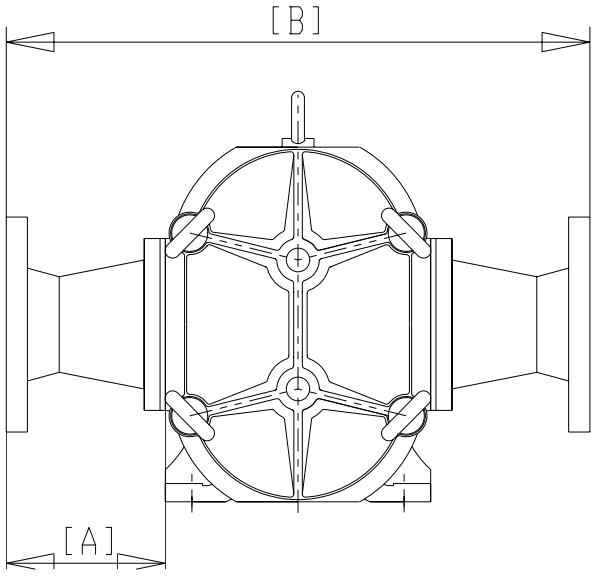


Weight 107 kg

Measure above single flange [A] / Measure above flanges [B]

PL 200	DN 80 [mm]	*DN 100 [mm]	DN 125 [mm]	DN 150 [mm]	DN 200 [mm]
DIN 2633	156/570	136/530	151/560	181/620	211/682
ANSI 150	175/608	160/578	185/628	236/730	

* Standard flange



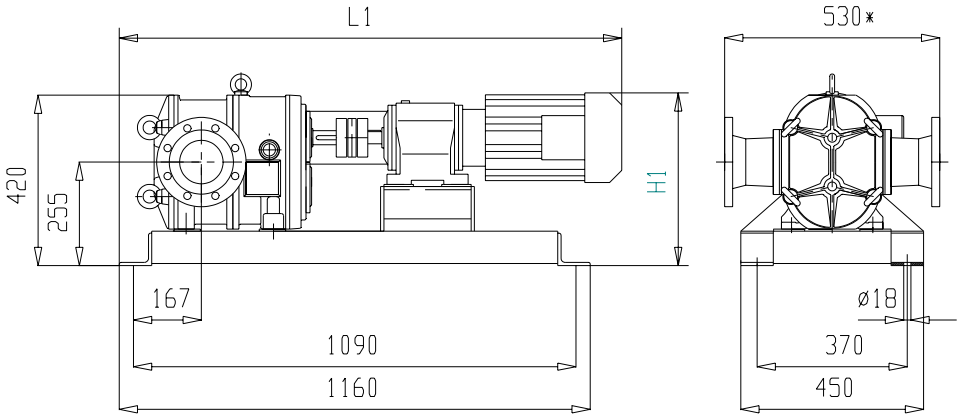
Dimensions may differ due to production reasons!

BÖRGER

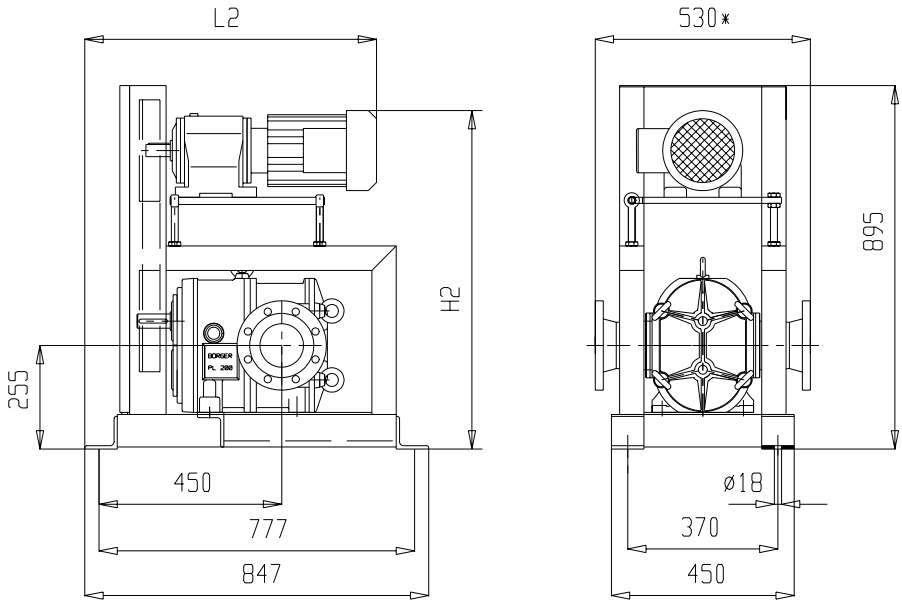
PL Series

PL 200

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
2,2	175	1150	414	706	834
3	180	1150	414	706	834
4	205	1176	426	732	846
5,5	215	1233	426	789	846
7,5	240	1295	453	831	873
9,2**	270	1295	453		
11**	295	1420	453		
15**	320	1467	481		

* Standard flange

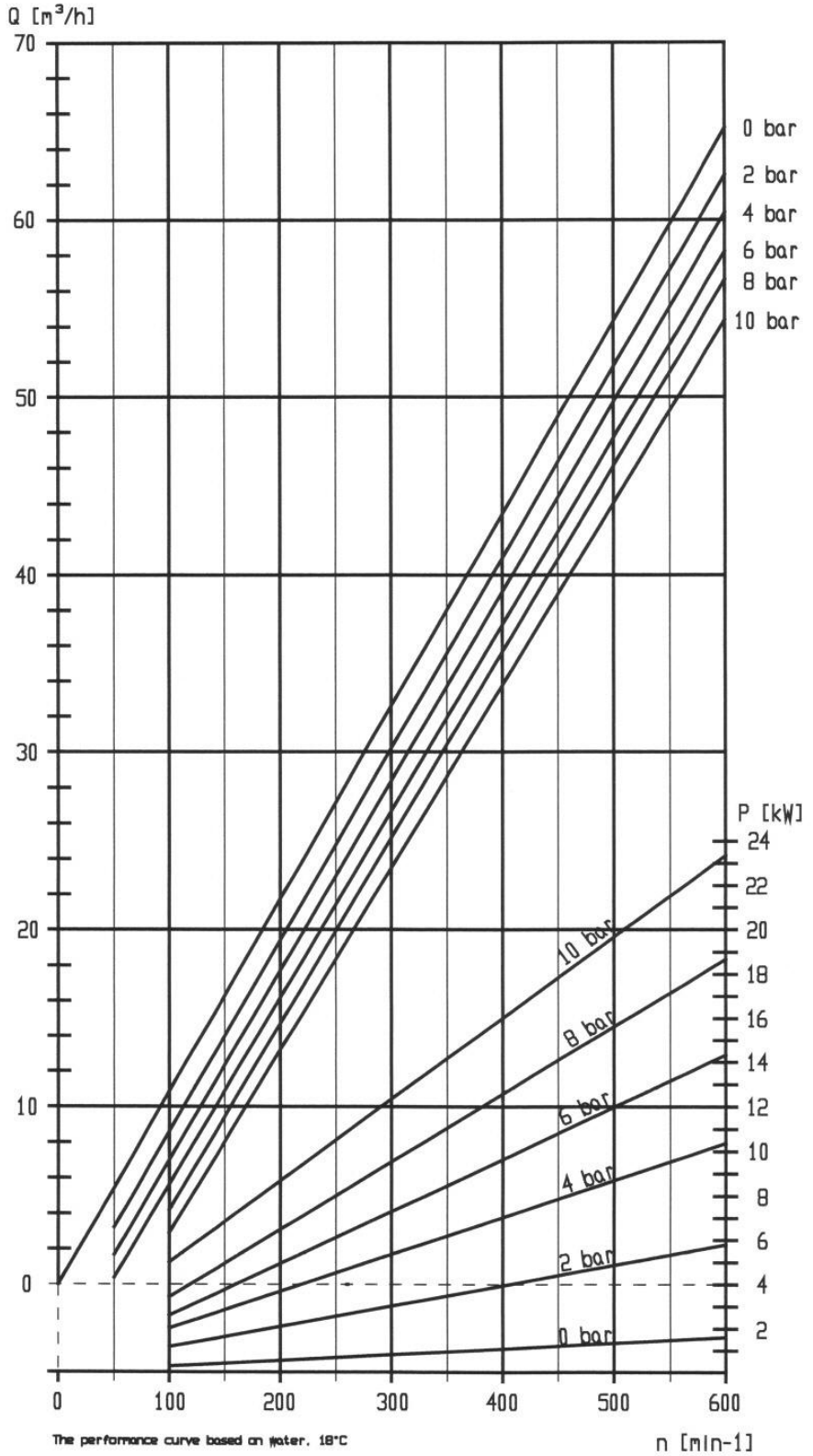
**** not available as overhead mounted arrangement**

Dimensions may differ due to production reasons!

BÖRGER®

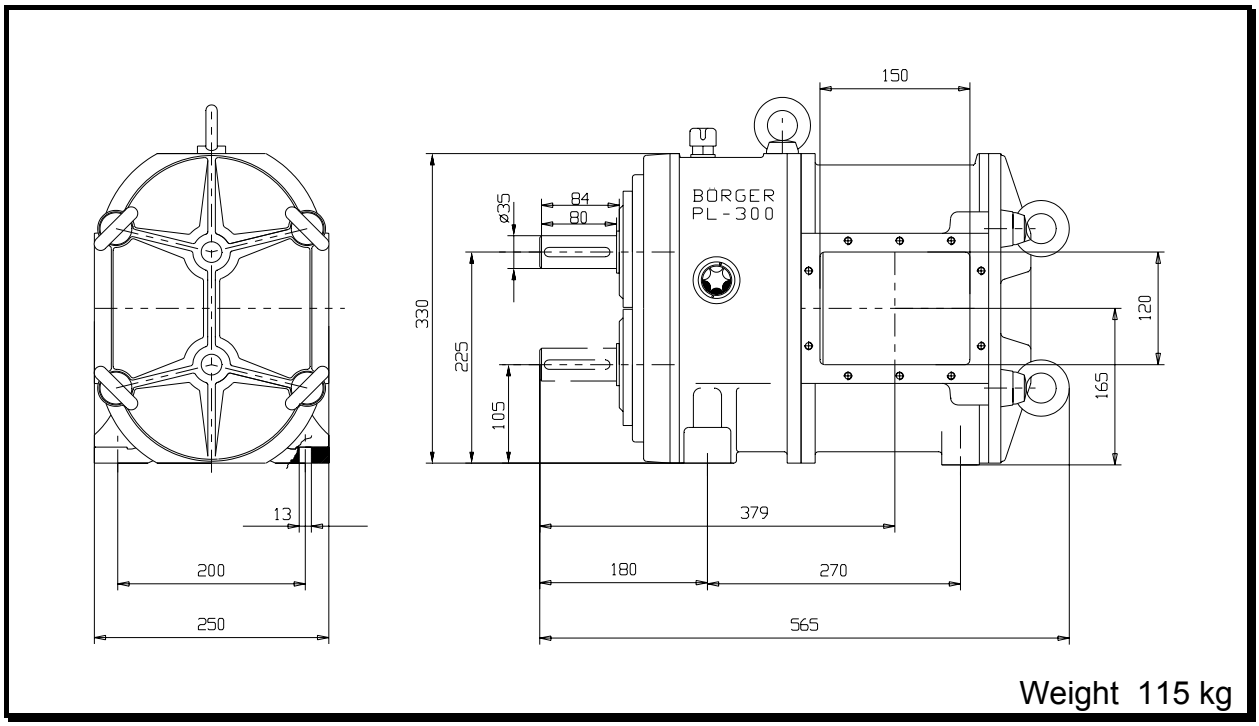
PL 200

performance curve



The performance curve based on water, 18°C

PL 300

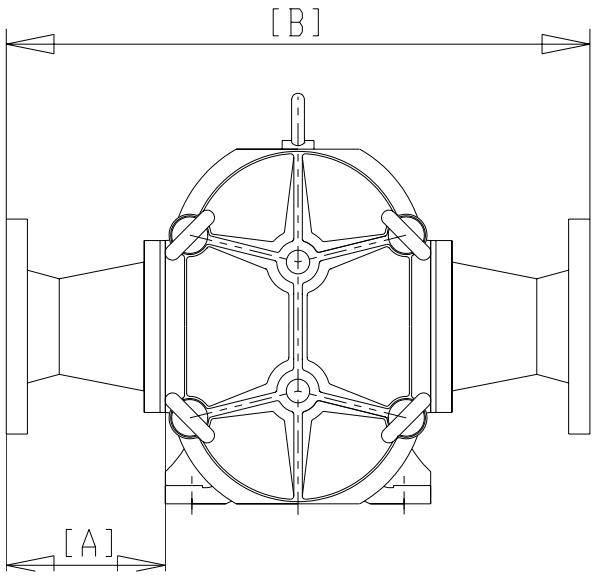


Weight 115 kg

Measure above single flange [A] / Measure above flanges [B]

PL 300	DN 80 [mm]	DN 100 [mm]	*DN 125 [mm]	DN 150 [mm]	DN 200 [mm]
DIN 2633	236/730	201/660	161/580	166/590	196/650
ANSI 150	261/770	225/708	196/650	222/702	236/730

* Standard flange



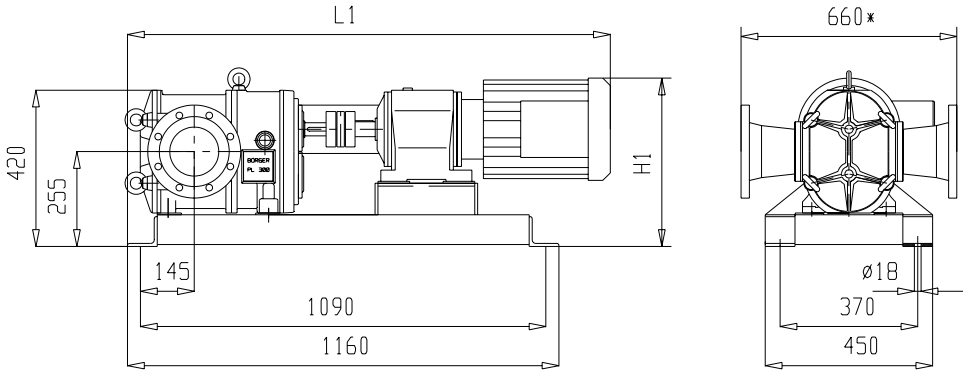
Dimensions may differ due to production reasons!

BÖRGER

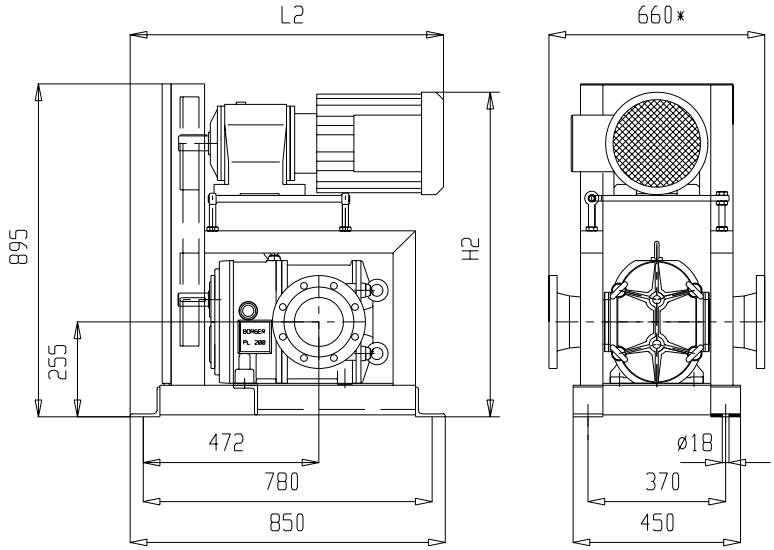
PL Series

PL 300

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
2,2	190	1150	414	706	834
3	205	1150	414	706	834
4	220	1176	426	732	846
5,5	230	1233	426	789	846
7,5	275	1295	453	831	873
9,2**	295	1295	453		
11**	305	1420	453		
15**	335	1467	481		

* Standard flange

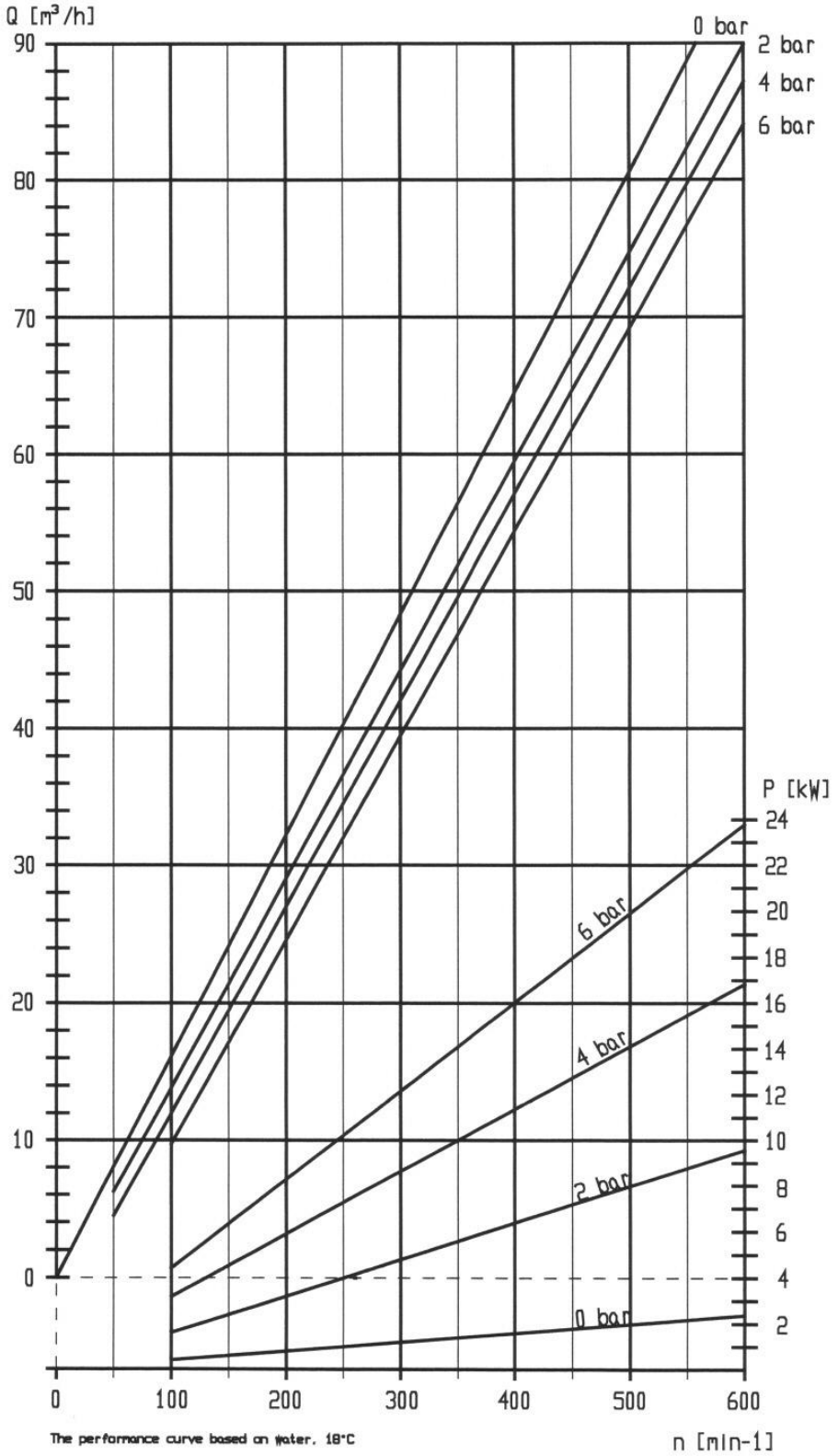
** not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

BÖRGER®

PL 300

performance curve

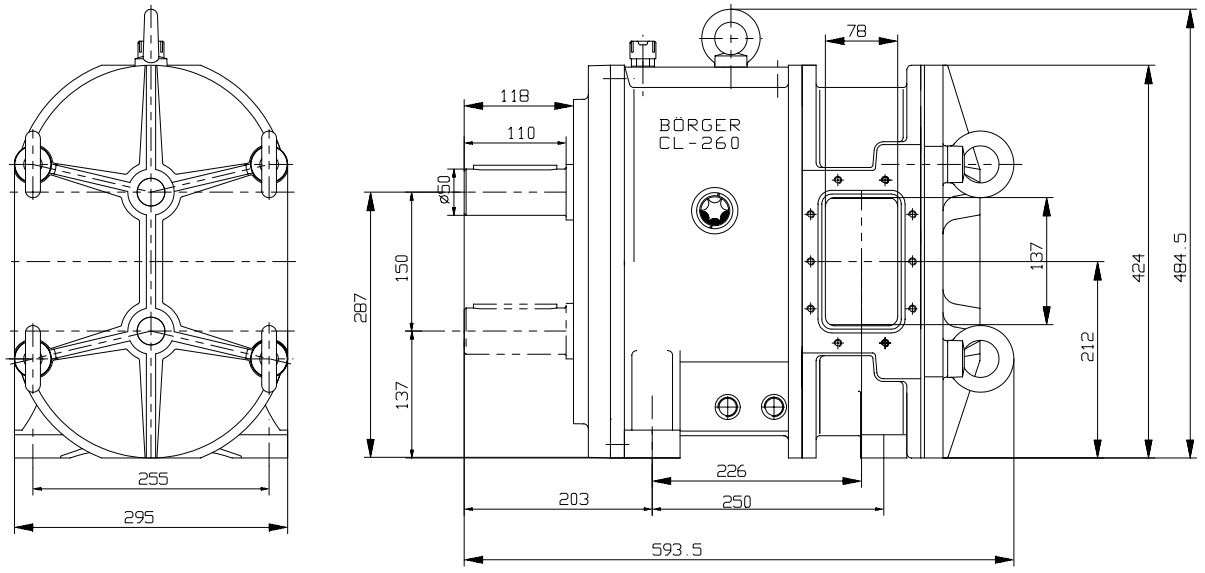


BÖRGER

6

CL Series

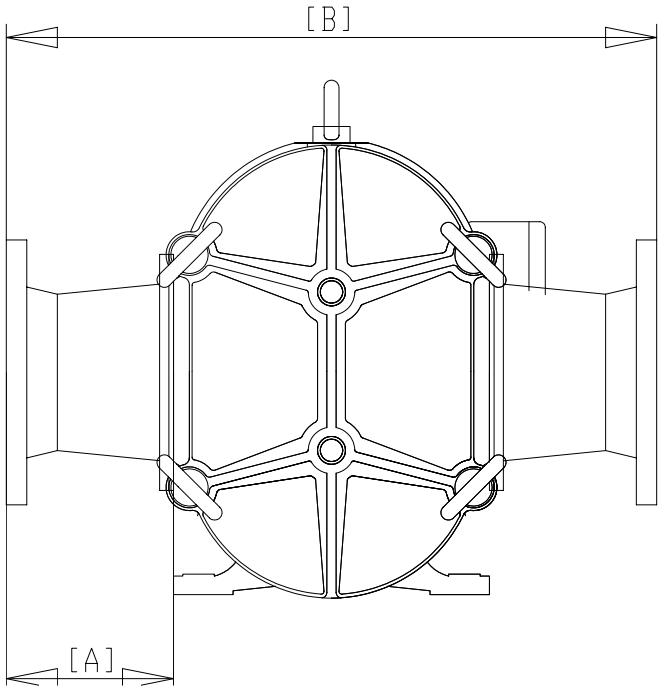
CL 260



Weight 180 kg

Measure above single flange [A] / Measure above flanges [B]

CL 260	DN 80 [mm]	DN 100 [mm]	DN 125 [mm]	DN 150 [mm]	DN 200 [mm]
DIN 2633		165/630	150/600		
ANSI 150					



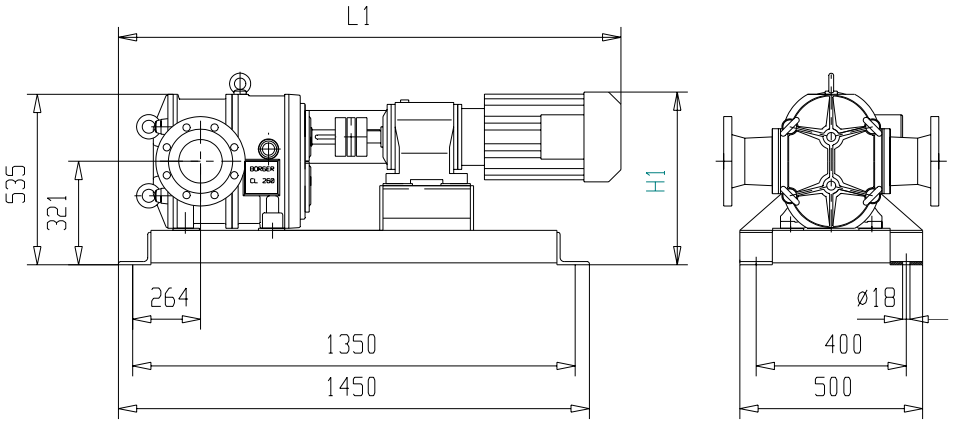
Dimensions may differ due to production reasons!

BÖRGER®

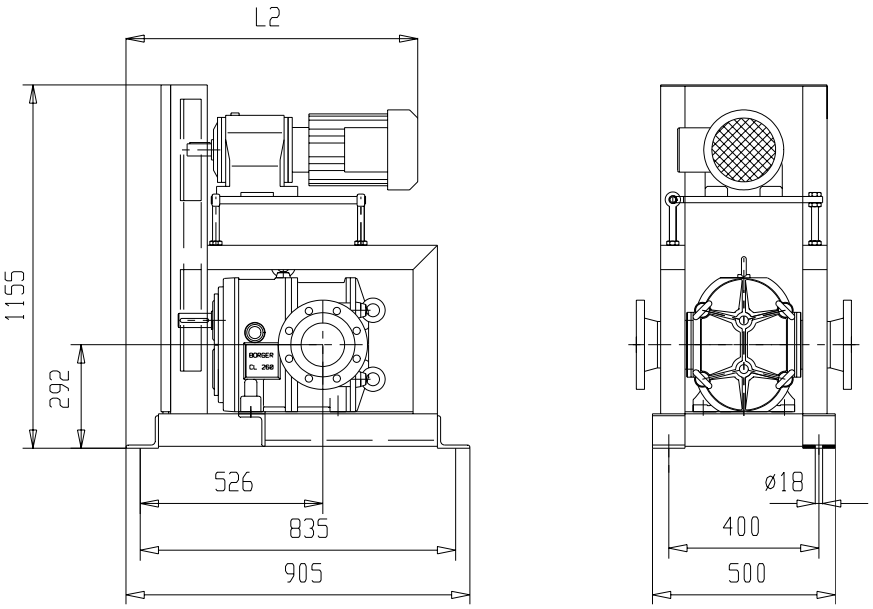
CL Series

CL 260

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions		
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]
3	293	1365	500	800
4	308	1390	515	825
5,5	318	1525	530	935
7,5	363	1525	530	935
9,2	383	1560	530	945
11*	393	1665		
15*	423	1665		

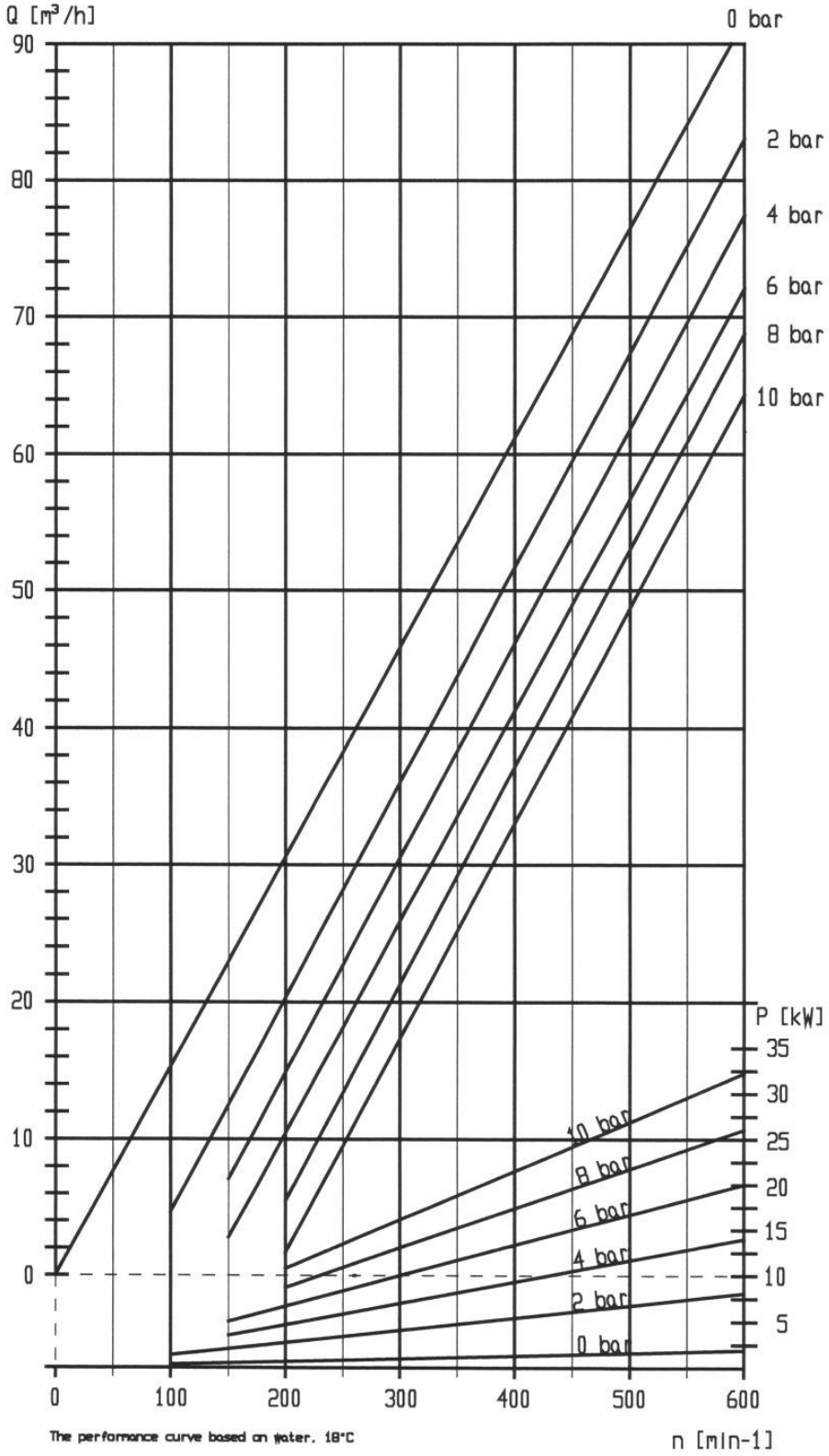
* not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

BÖRGER®

CL 260

performance curve

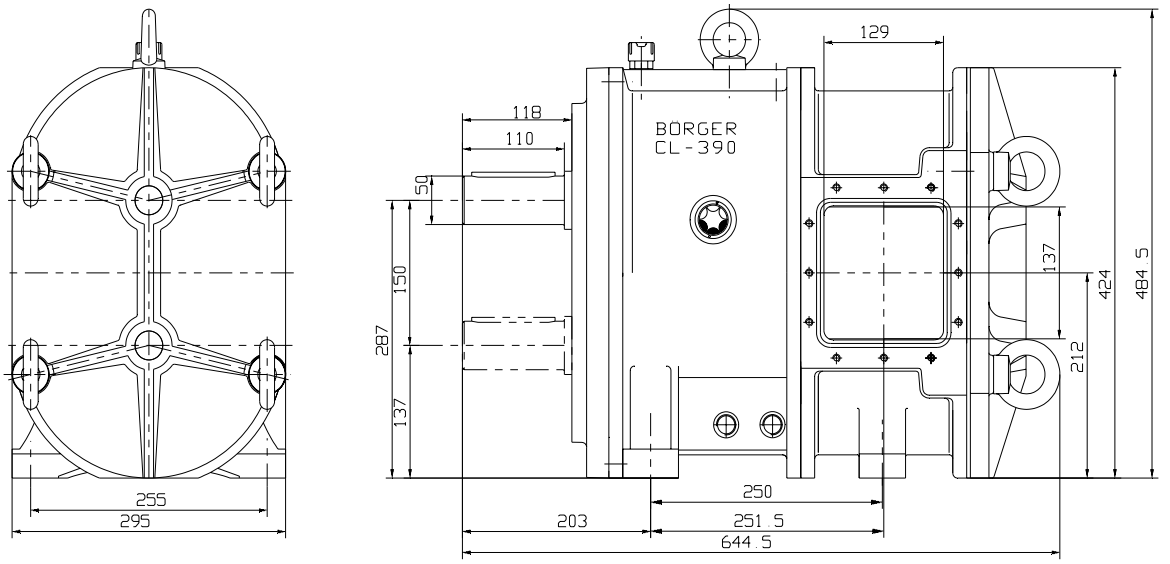


The performance curve based on water, 18°C

BÖRGER

CL Series

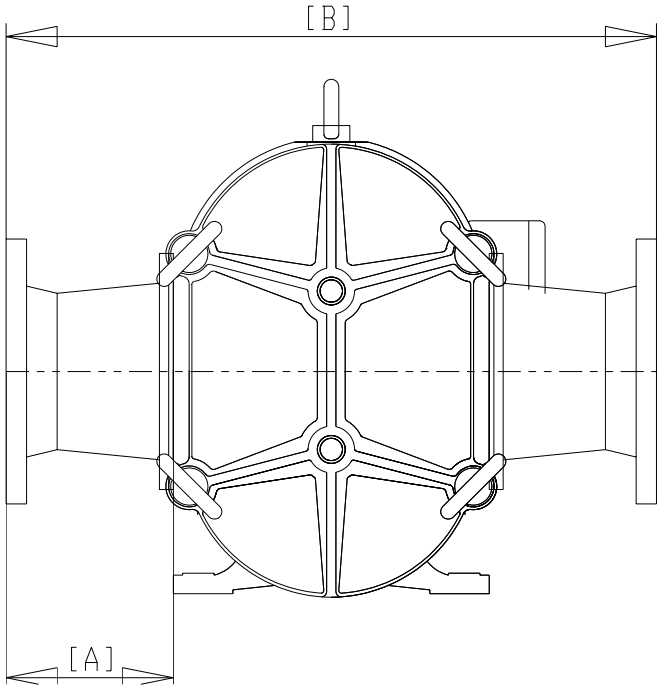
CL 390



Weight 200 kg

Measure above single flange [A] / Measure above flanges [B]

CL 390	DN 80 [mm]	DN 100 [mm]	DN 125 [mm]	DN 150 [mm]	DN 200 [mm]
DIN 2633	195/690	160/615	175/650	160/620	260/820
ANSI 150			195/690	200/700	



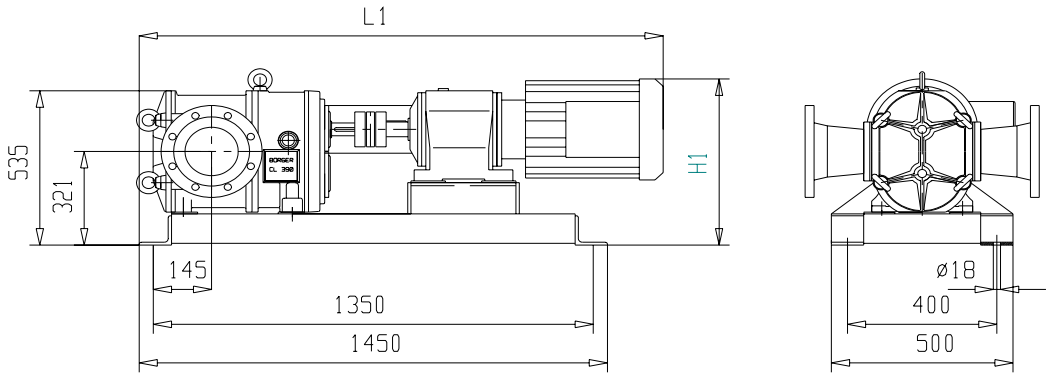
Dimensions may differ due to production reasons!

BÖRGER

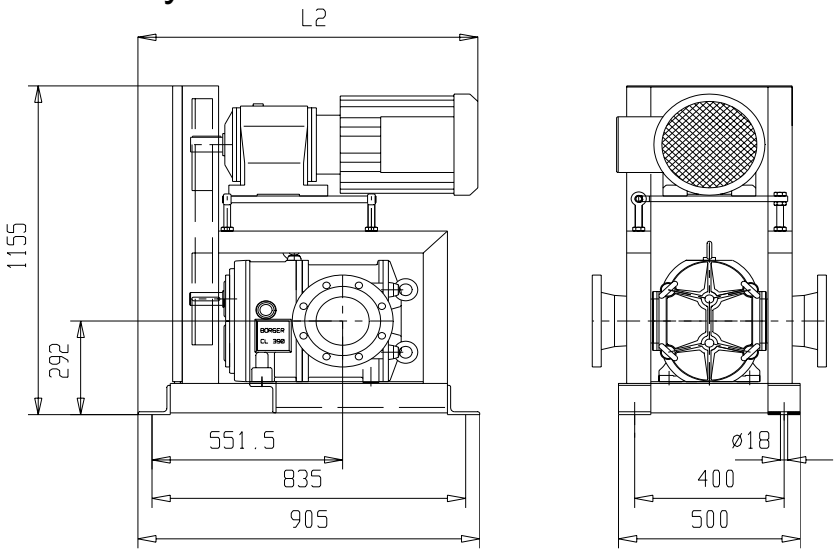
CL Series

CL 390

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions		
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]
3	313	1365	500	800
4	328	1390	515	825
5,5	338	1525	530	935
7,5	368	1525	530	935
9,2	403	1560	530	945
11*	413	1665		
15*	443	1665		
18,5*	462	1775		

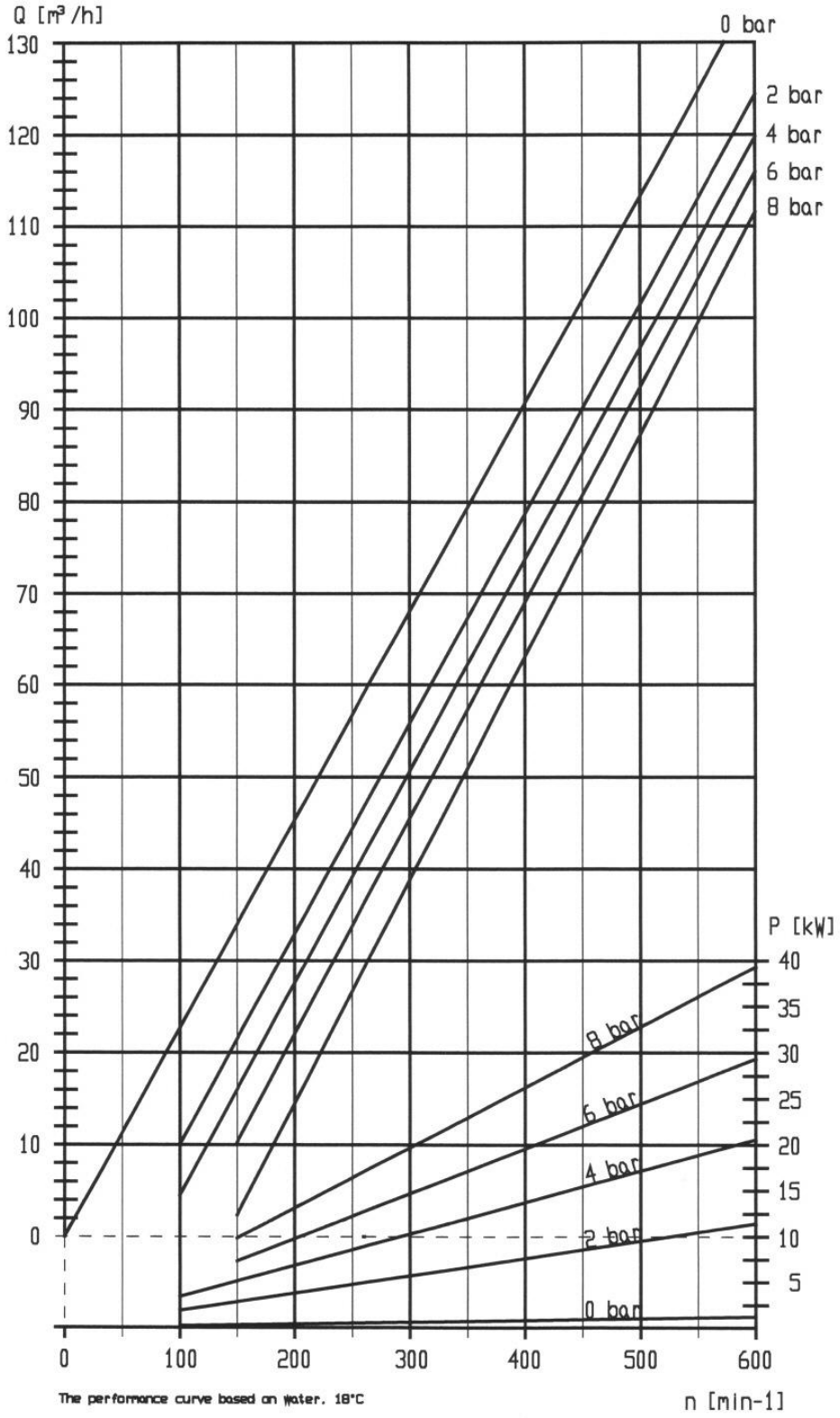
* not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

BÖRGER®

CL 390

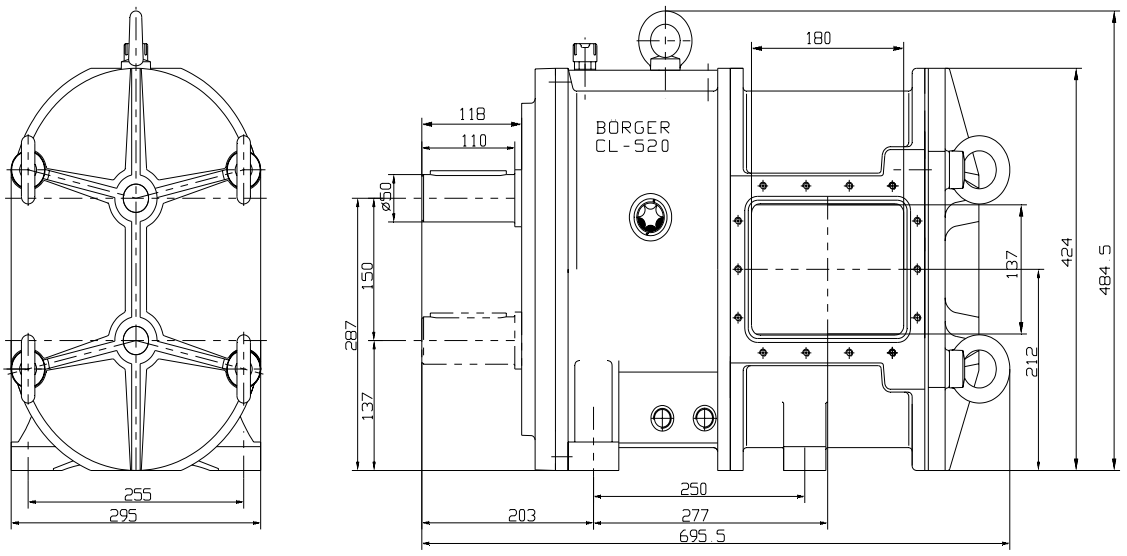
performance curve



BÖRGER®

CL Series

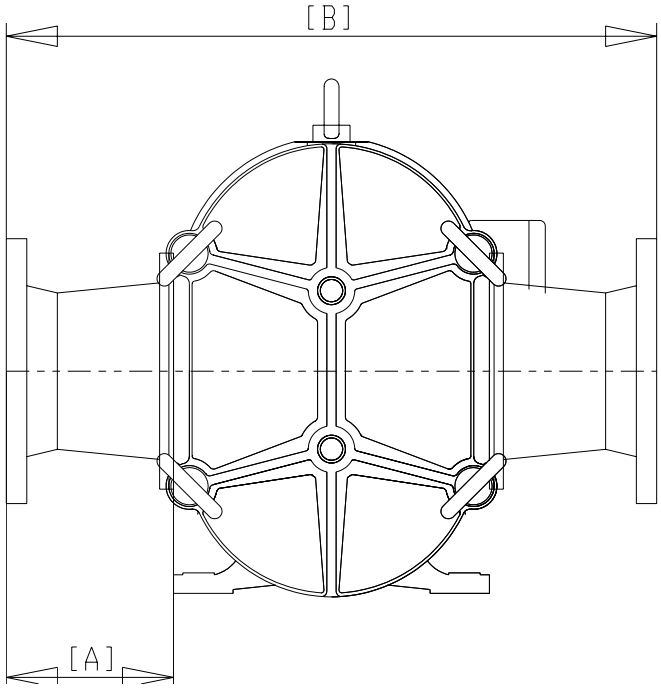
CL 520



Weight 200 kg

Measure above single flange [A] / Measure above flanges [B]

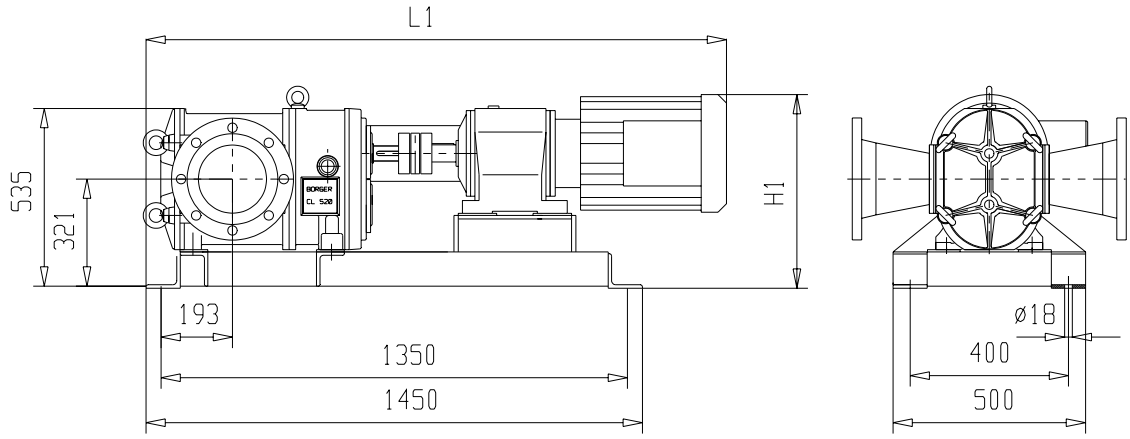
CL 520	DN 80 [mm]	DN 100 [mm]	DN 125 [mm]	DN 150 [mm]	DN 200 [mm]
DIN 2633			250/795	165/625	
ANSI 150					



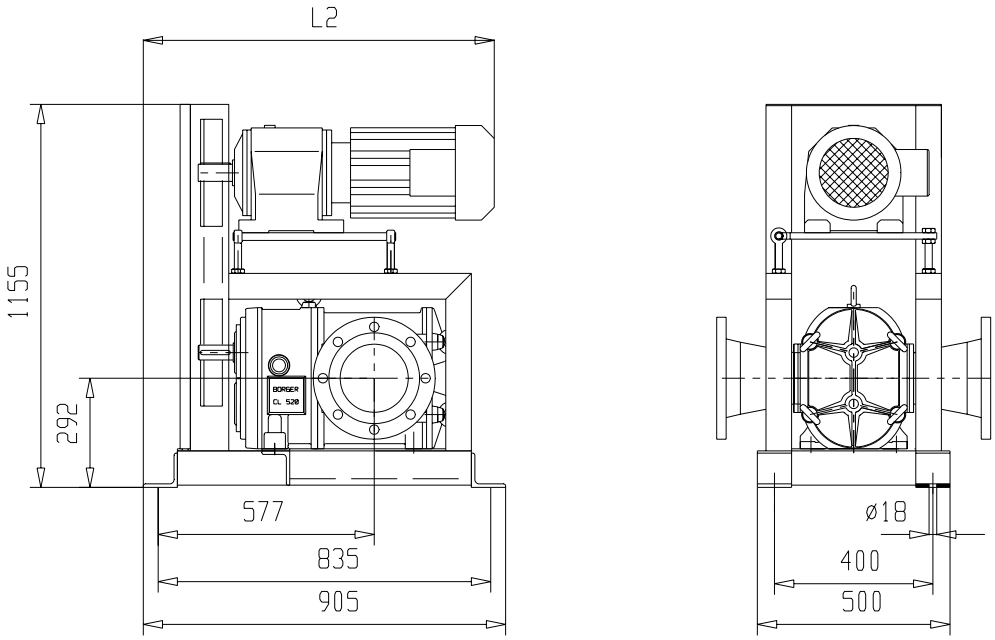
Dimensions may differ due to

CL 520

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions		
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]
3	333	1365	500	800
4	348	1390	515	825
5,5	358	1525	530	935
7,5	388	1525	530	935
9,2	423	1560	530	945
11*	433	1665		
15*	463	1665		
18,5*	482	1775		

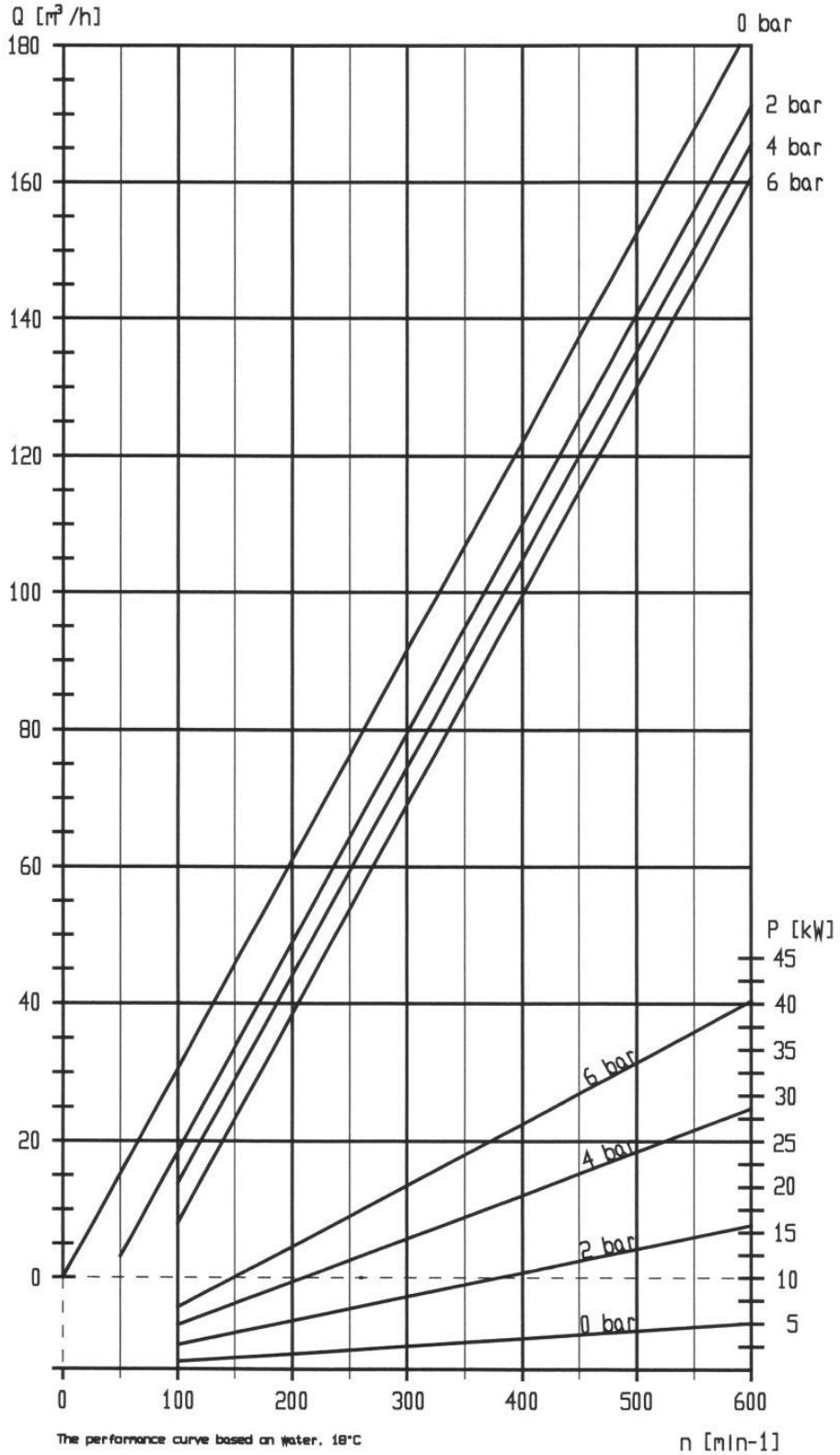
* not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

BÖRGER®

CL 520

performance curve

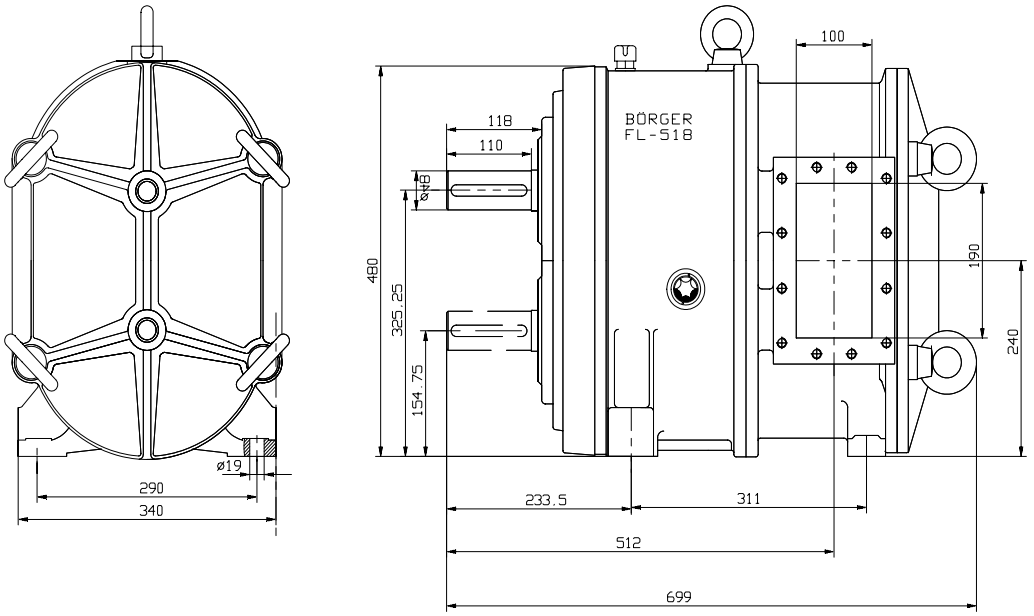


The performance curve based on water, 18°C

7

FL and FLA Series

FL 518

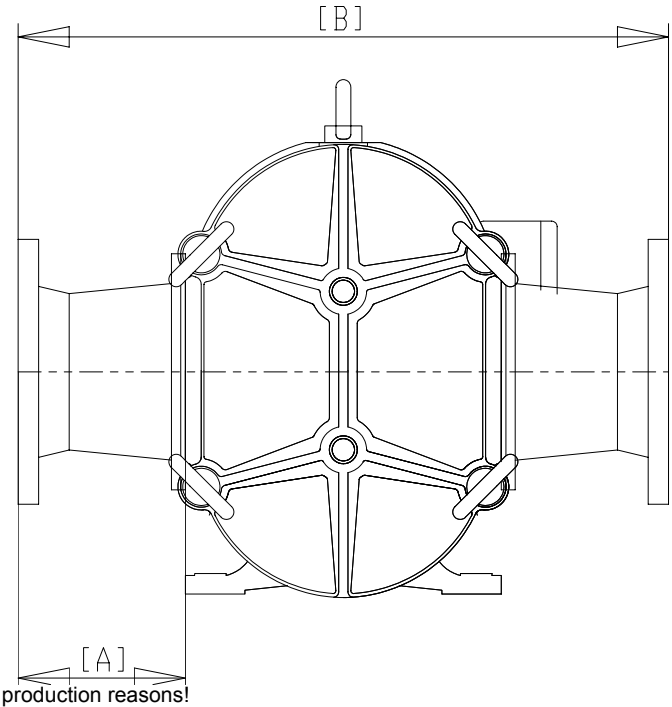


Weight 262 kg

Measure above single flange [A] / Measure above flanges [B]

FL 518	*DN 125 [mm]	DN 150 [mm]	DN 200 [mm]
DIN 2633	166/680	176/700	251/850
ANSI 150	200/748	232/812	291/930

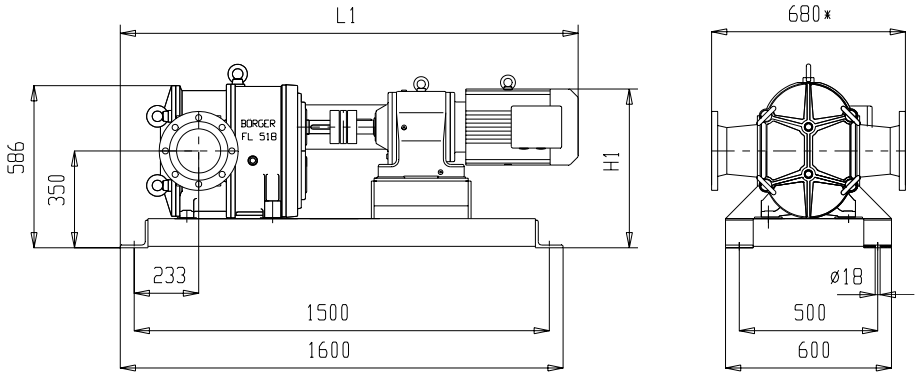
* Standard flange



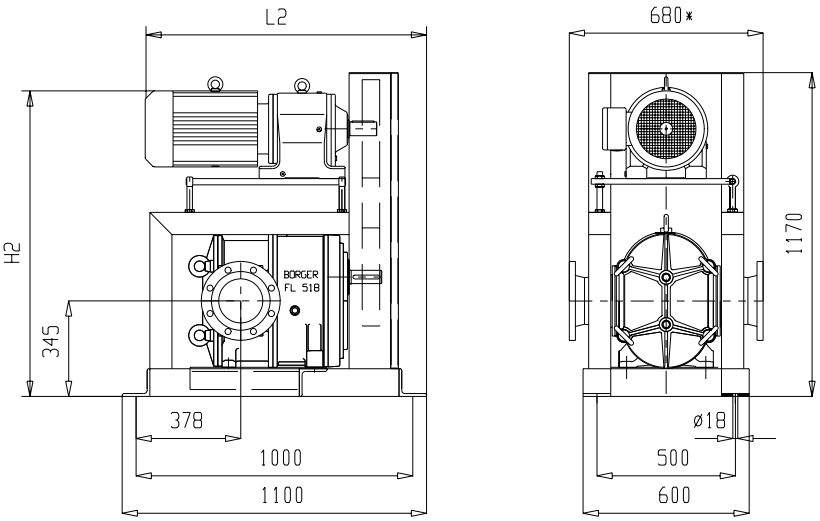
Dimensions may differ due to production reasons!

FL 518

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
3	305	1437	535	1066	818
4	315	1463	547	1078	844
5,5	335	1520	547	1078	901
7,5	370	1530	574	1105	911
9,2	395	1530	574	1105	911
11	400	1655	574	1105	1014
15	480	1702	602	1133	1061
18,5**	535	1839	602		
22**	560	1839	602		
30**	610	1839	602		
37**	780	1946	634		
45**	810	1946	634		

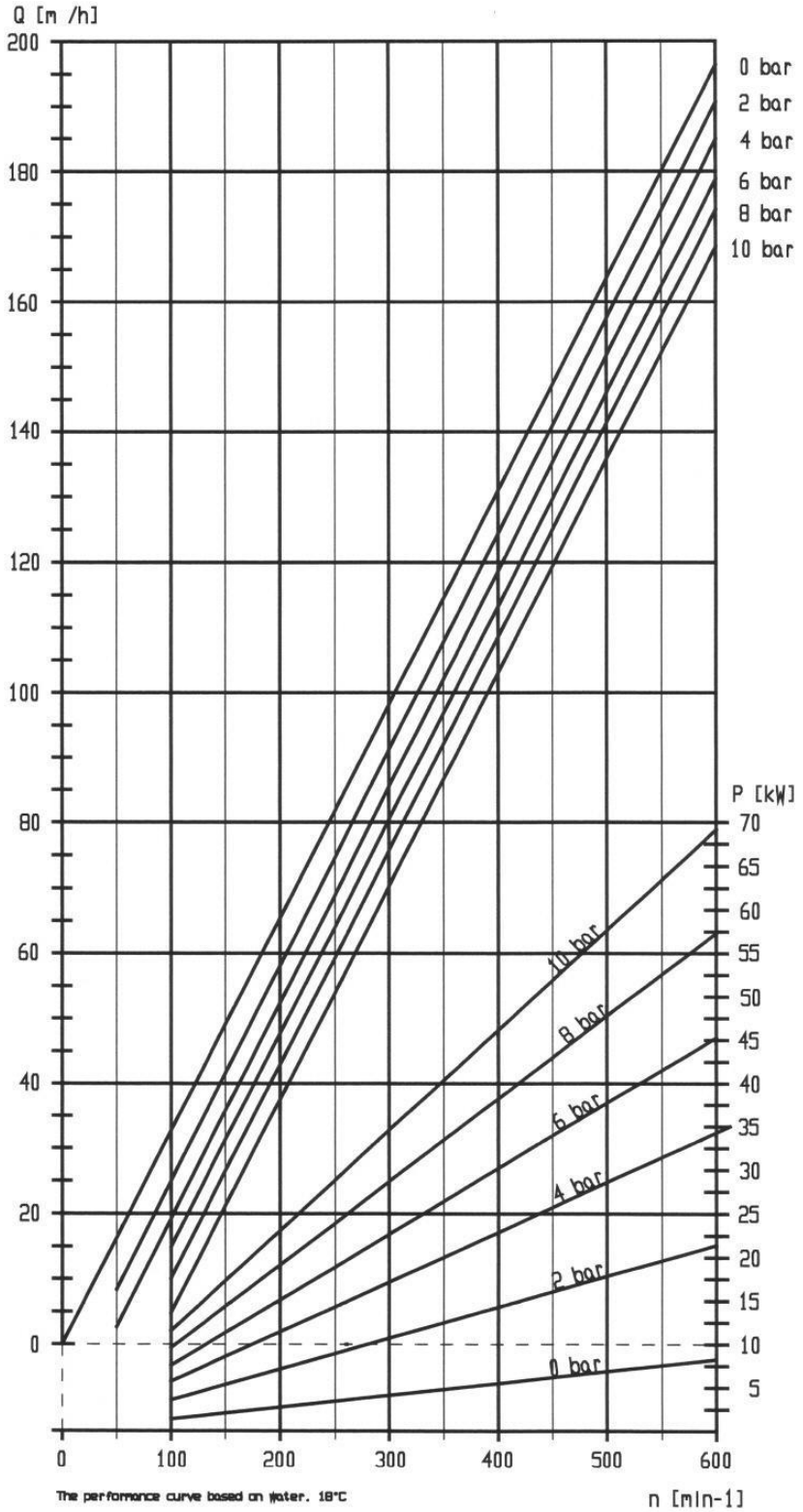
* Standard flange
** not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

BÖRGER®

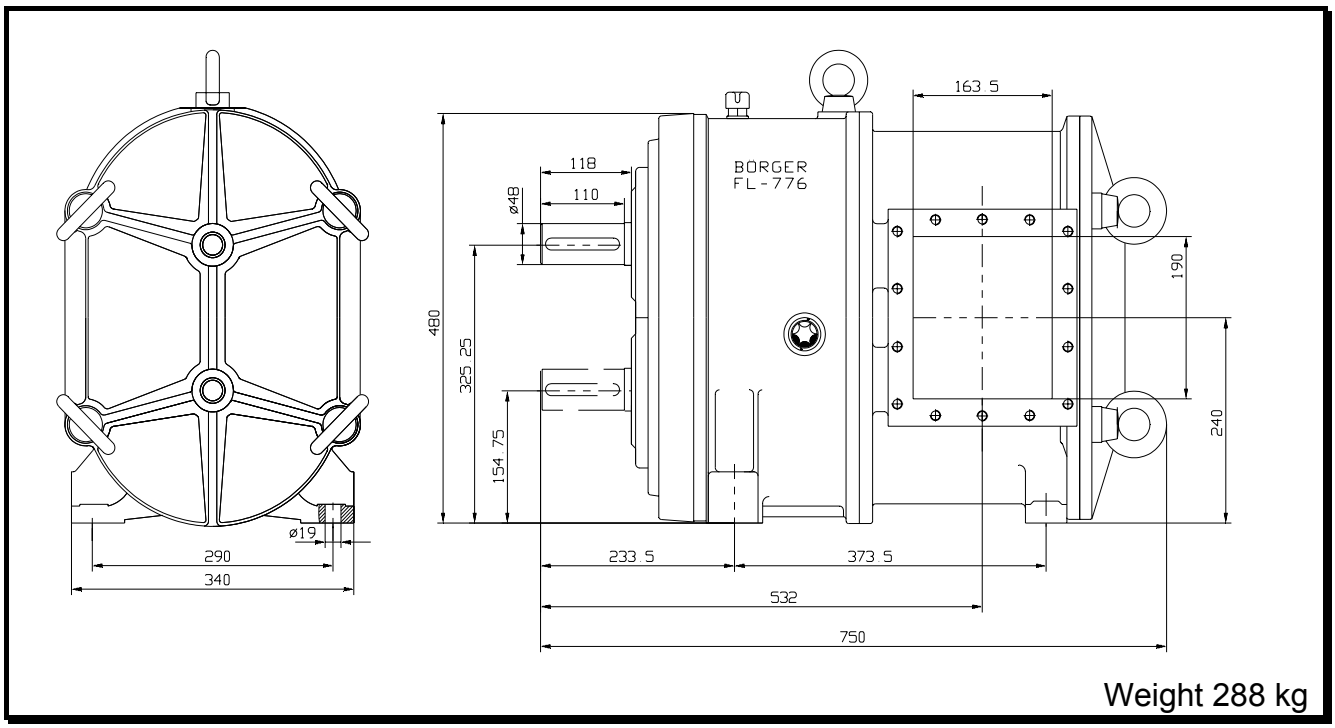
FL 518

performance curve



The performance curve based on water. 18°C

FL 776

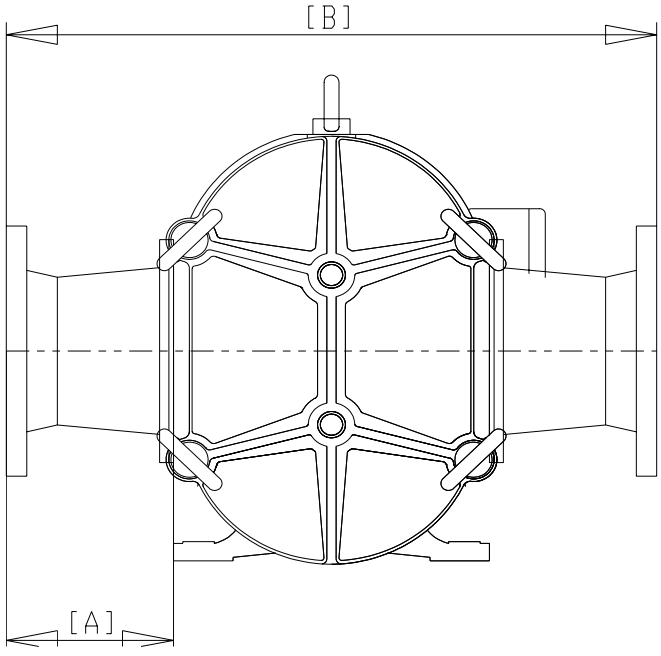


Weight 288 kg

Measure above single flange [A] / Measure above flanges [B]

FL 776	DN 125 [mm]	*DN 150 [mm]	*DN 200 [mm]
DIN 2633	201/750	176/700	151/650
ANSI 150	200/748	232/812	291/930

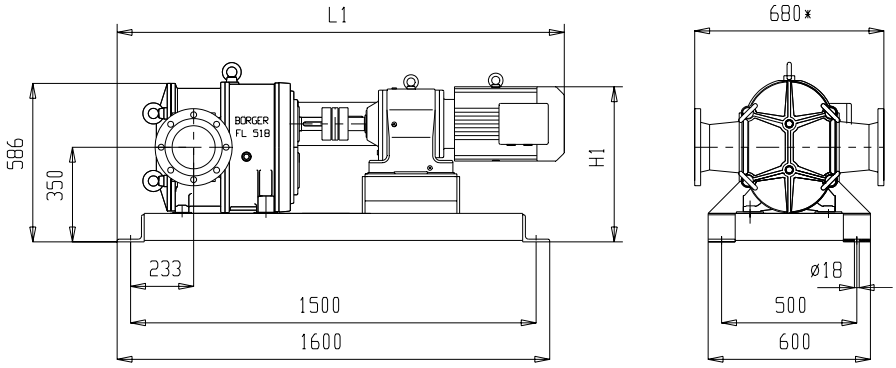
* Standard flange



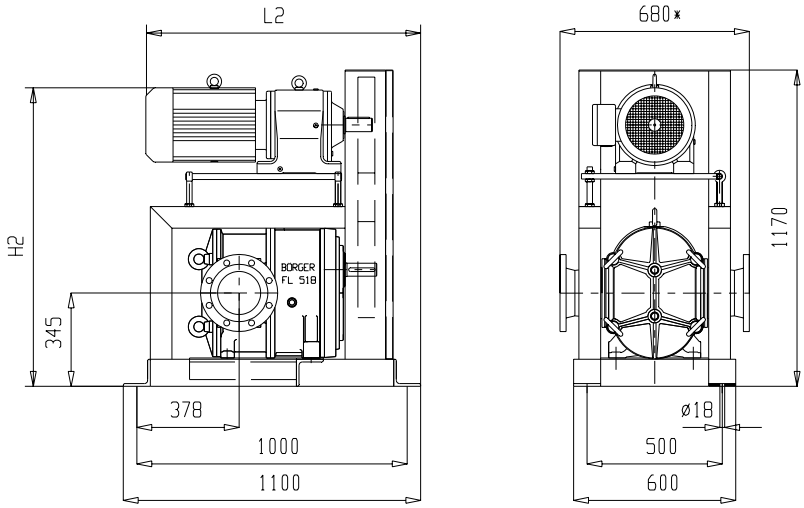
Dimensions may differ due to production reasons!

FL 776

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
4	340	1463	547	1078	844
5,5	360	1520	547	1078	901
7,5	395	1530	574	1105	911
9,2	420	1530	574	1105	911
11	425	1655	574	1105	014
15	505	1702	602	1133	1061
18,5**	560	1839	602		
22**	585	1839	602		
30**	635	1839	602		
37**	805	1946	634		
45**	865	1946	634		

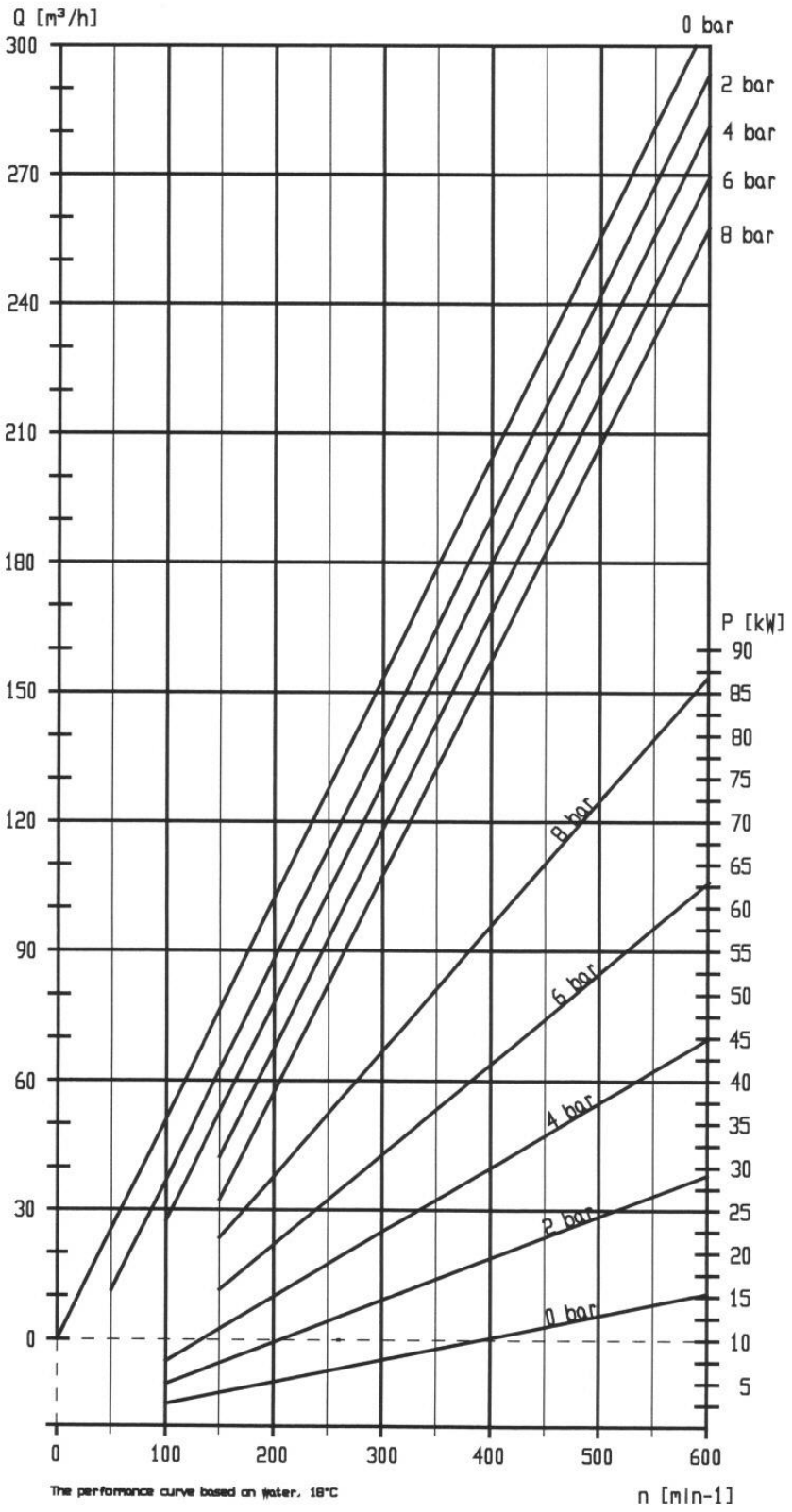
* Standard flange
** not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

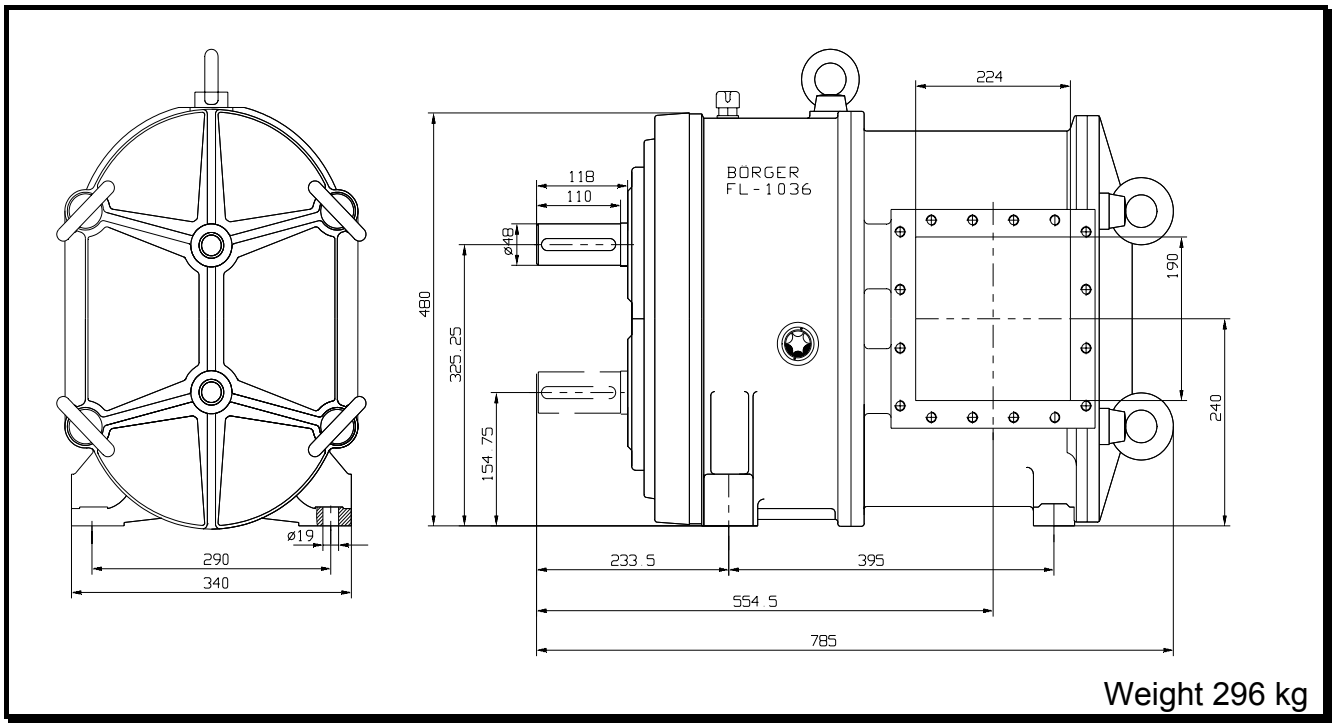
BÖRGER®

FL 776

performance curve



FL 1036

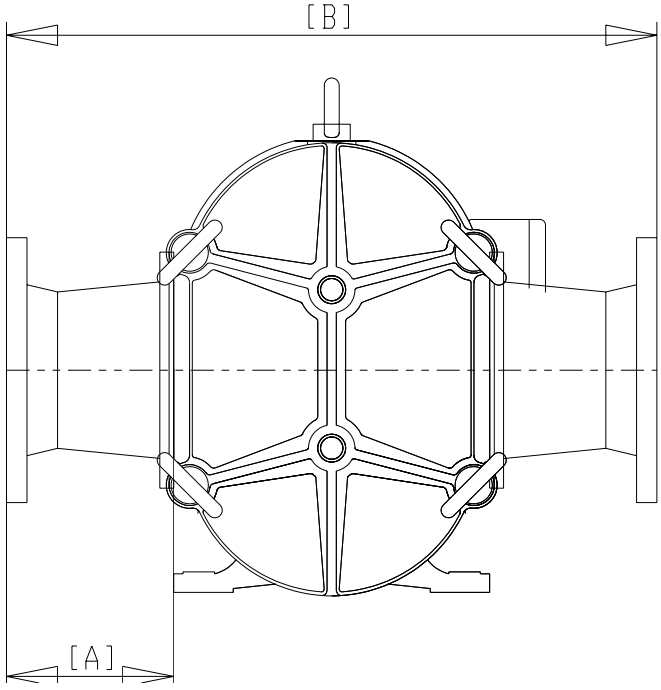


Weight 296 kg

Measure above single flange [A] / Measure above flanges [B]

FL 1036	DN 150 [mm]	*DN 200 [mm]	DN 250 [mm]
DIN 2633	226/800	201/750	200/780

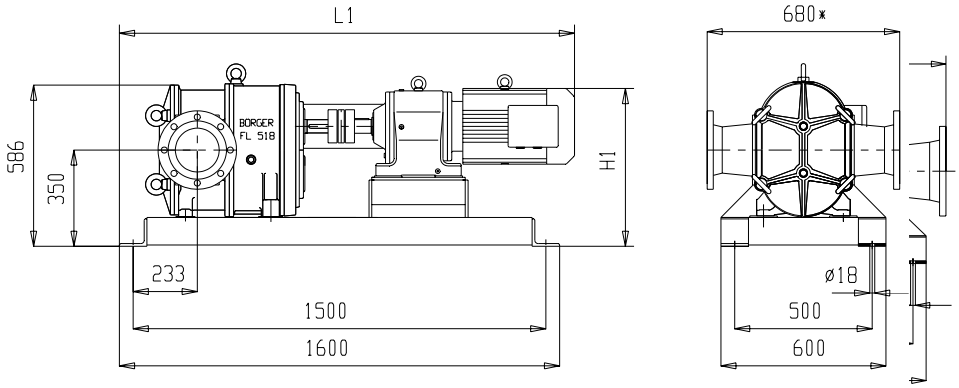
* Standard flange



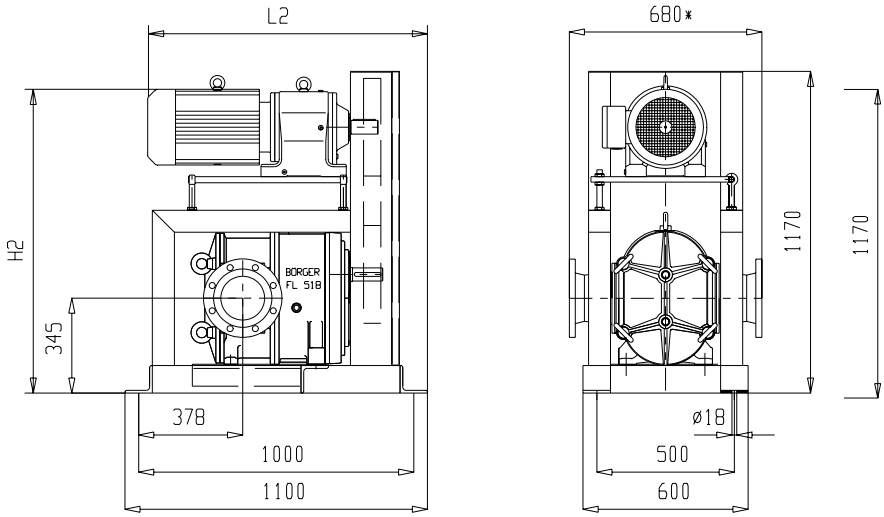
Dimensions may differ due to production reasons!

FL 1036

front side arrangement



overhead drive assembly



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	L2 [mm]	H2 [mm]
5,5	390	1520	547	1078	901
7,5	425	1530	574	1105	911
9,2	450	1530	574	1105	911
11	500	1655	574	1105	1014
15	540	1702	602	1133	1061
18,5**	590	1839	602	1133	1179
22**	615	1839	602	1133	1179
30**	665	1839	602		
37**	835	1946	634		
45**	895	1946	634		

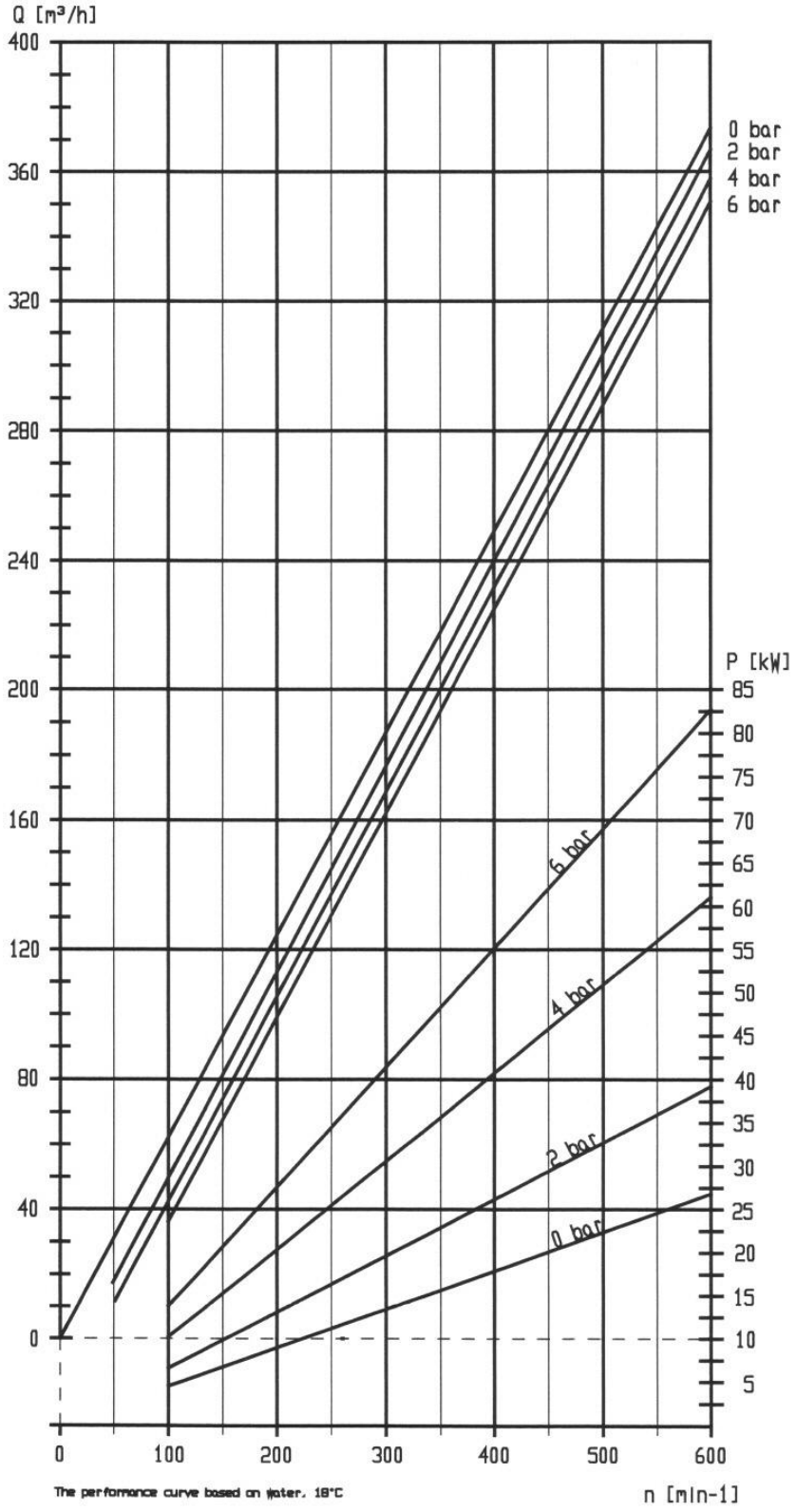
* Standard flange
** not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

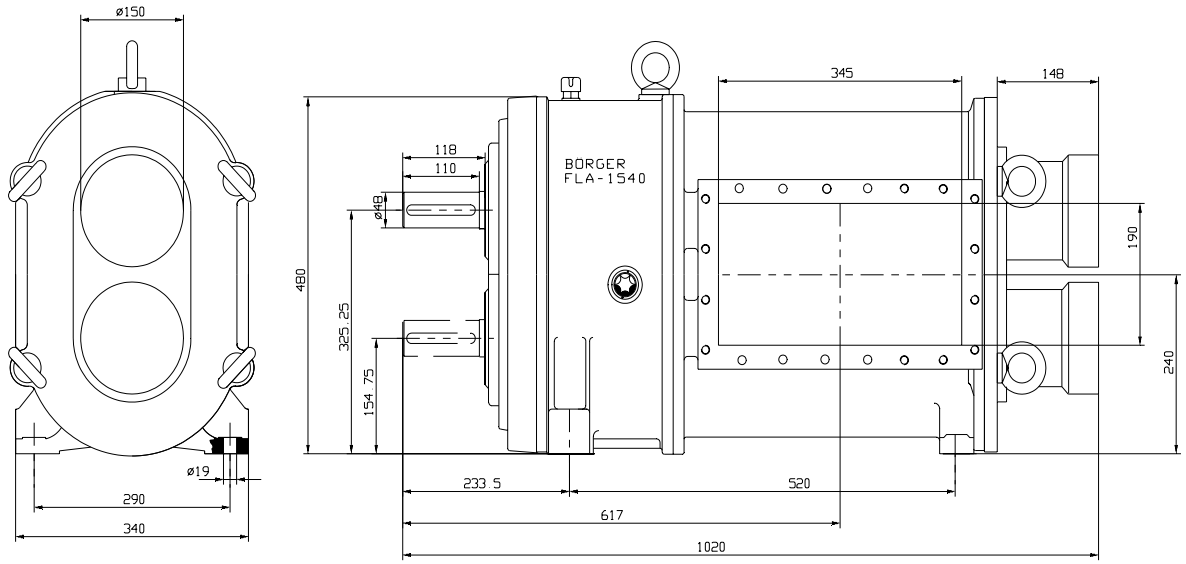
BÖRGER®

FL 1036

performance curve



FLA 1540

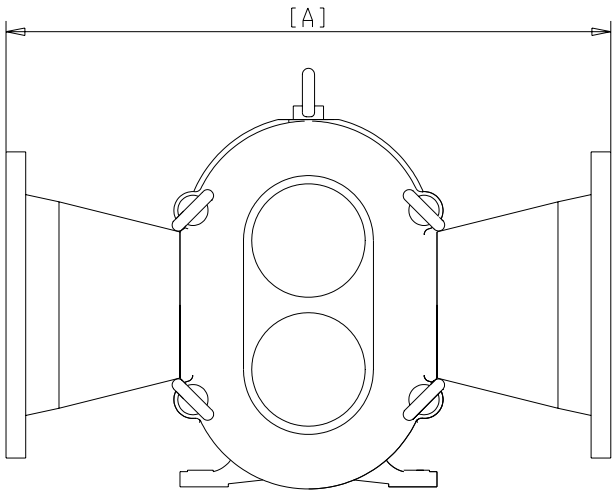


Weight 385 kg

Measure above flanges [A]

FL 1540	DN 200 [mm]	*DN 250 [mm]	DN 300 [mm]	DN 350 [mm]	DN 400 [mm]
DIN 2633	900	800	1000	1000	1000

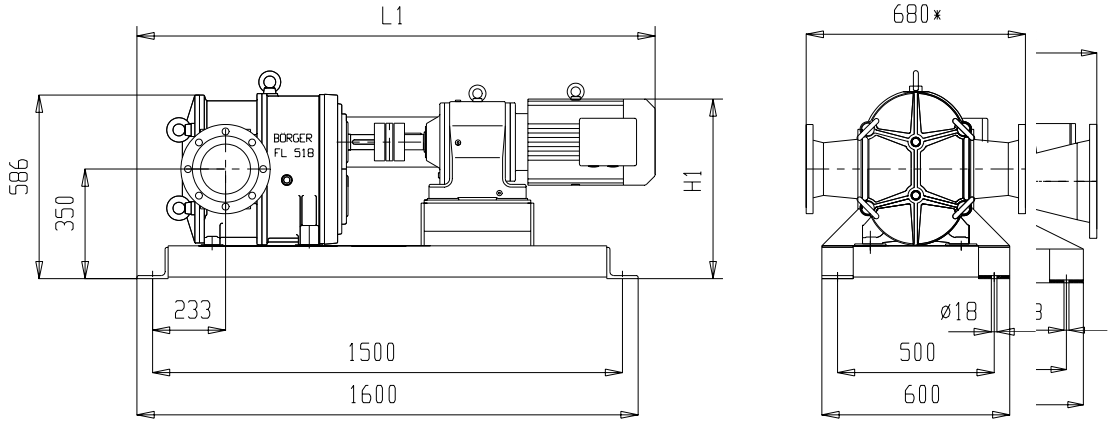
* Standard flange



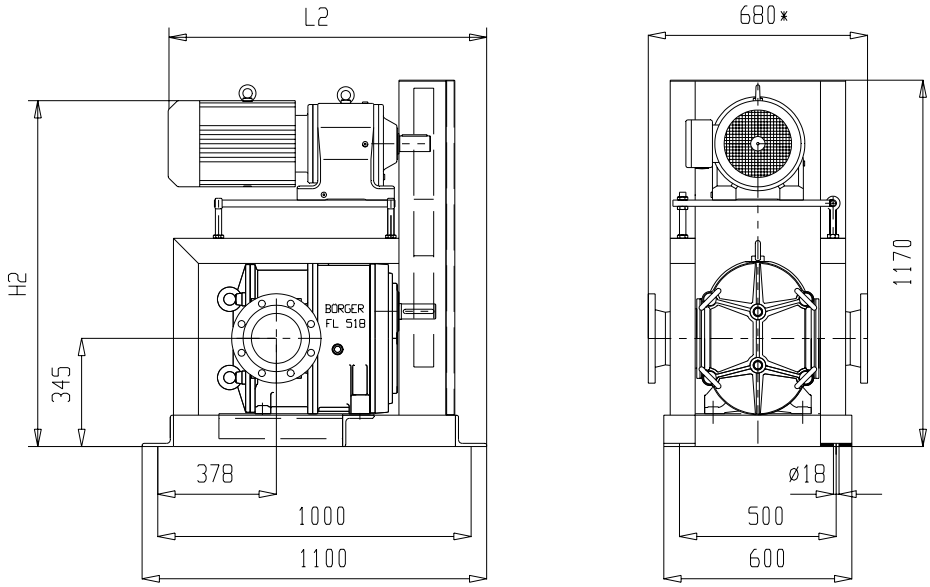
Dimensions may differ due to production reasons!

FLA 1540

front side arrangement



overhead drive assembly



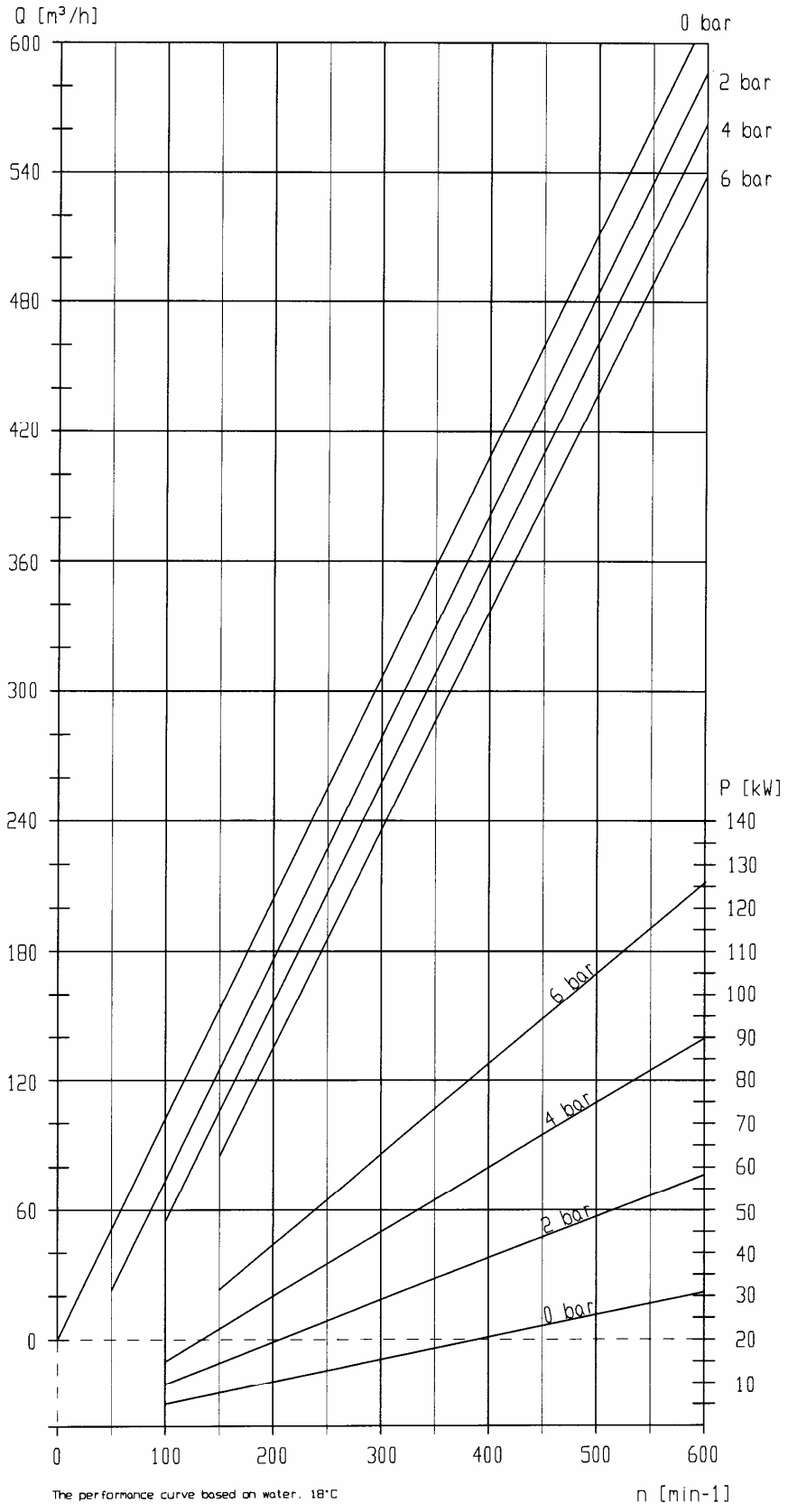
Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	e [mm]	f [mm]
11	755	1950	590	370	2000
15	875	1997	618	370	2000
18,5**	900	2099	618	370	2200
22**	918	2099	618	370	2200
30**	1045	2241	649	370	2200
37**	1096	2312	649	370	2400
45**	1130	2403	649	370	2400

* Standard flange
** not available as overhead mounted arrangement

Dimensions may differ due to production reasons!

FLA 1540

Performance curve



The performance curve based on water, 18°C

BÖRGER

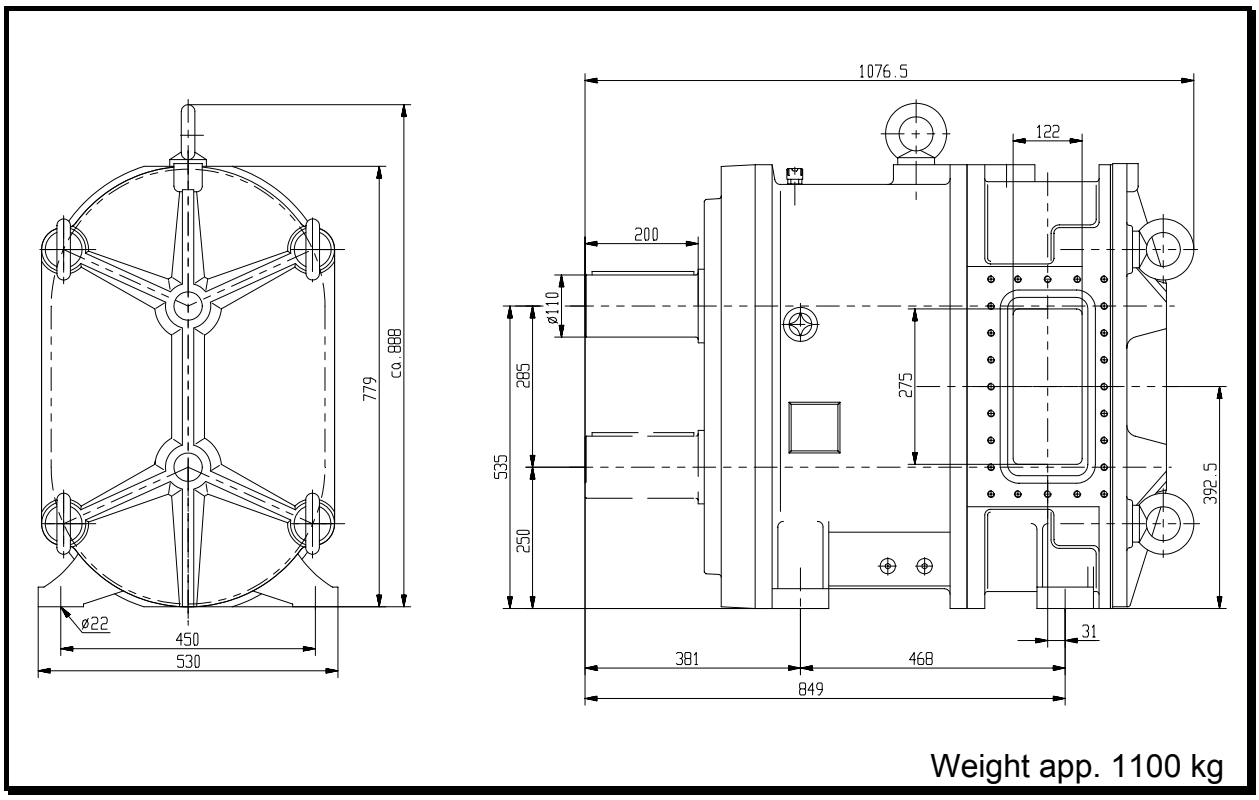
8

XL Series

BÖRGER®

XL Series

XL 1760

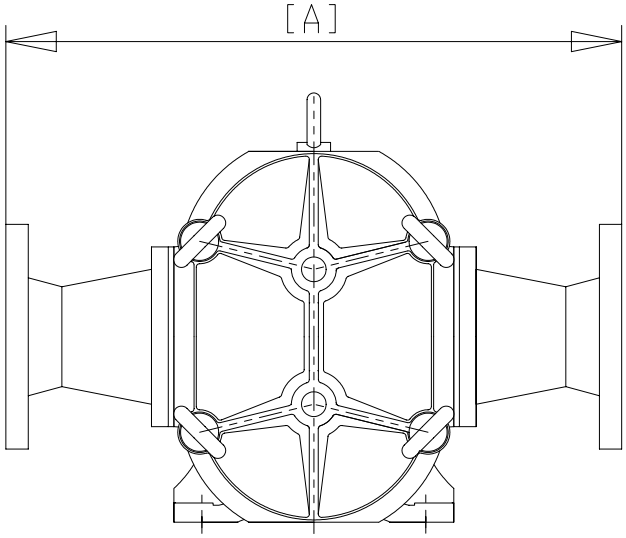


Weight app. 1100 kg

Measure above flanges [A]

FL 1540	DN 200 [mm]	*DN 250 [mm]	DN 300 [mm]	DN 350 [mm]	DN 400 [mm]
DIN 2633	-	1070	-	-	-

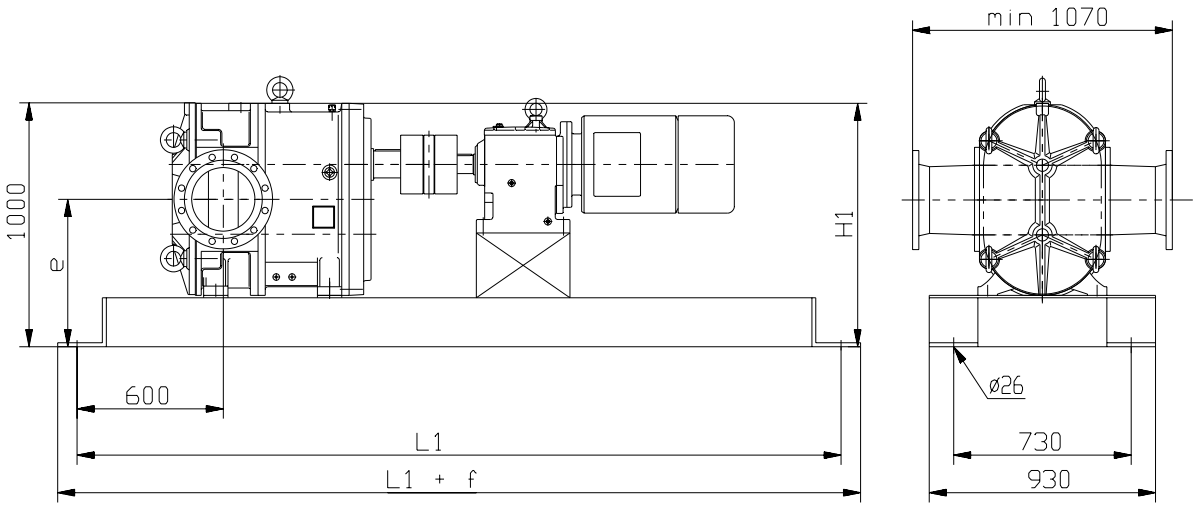
* Standard flange



Dimensions may differ due to production reasons!

XL 1760

front side arrangement

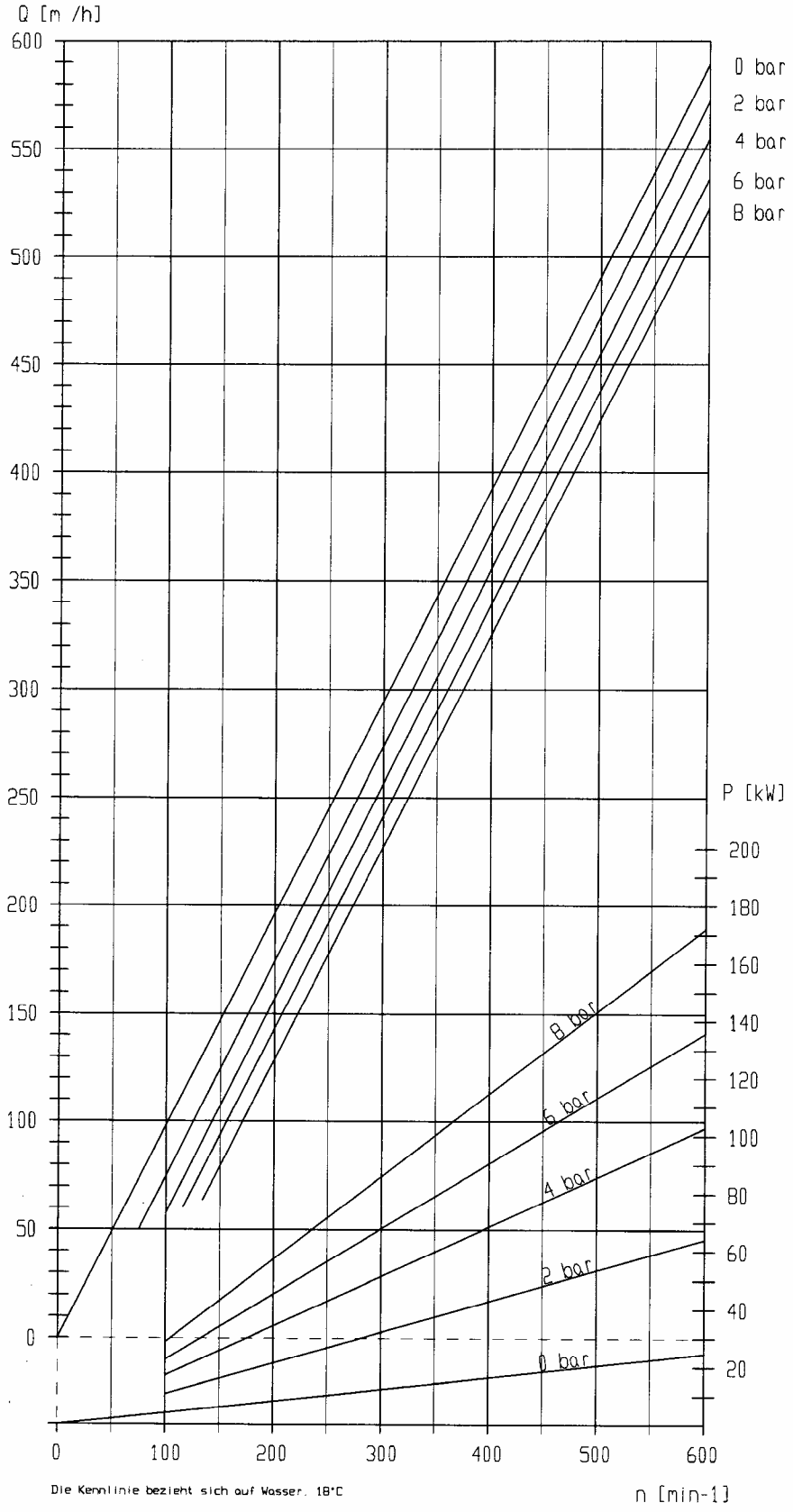


Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	e [mm]	f [mm]
45	ca. 1900	3140	995	602,5	160

Dimensions may differ due to production reasons!

XL 1760

Kennlinie

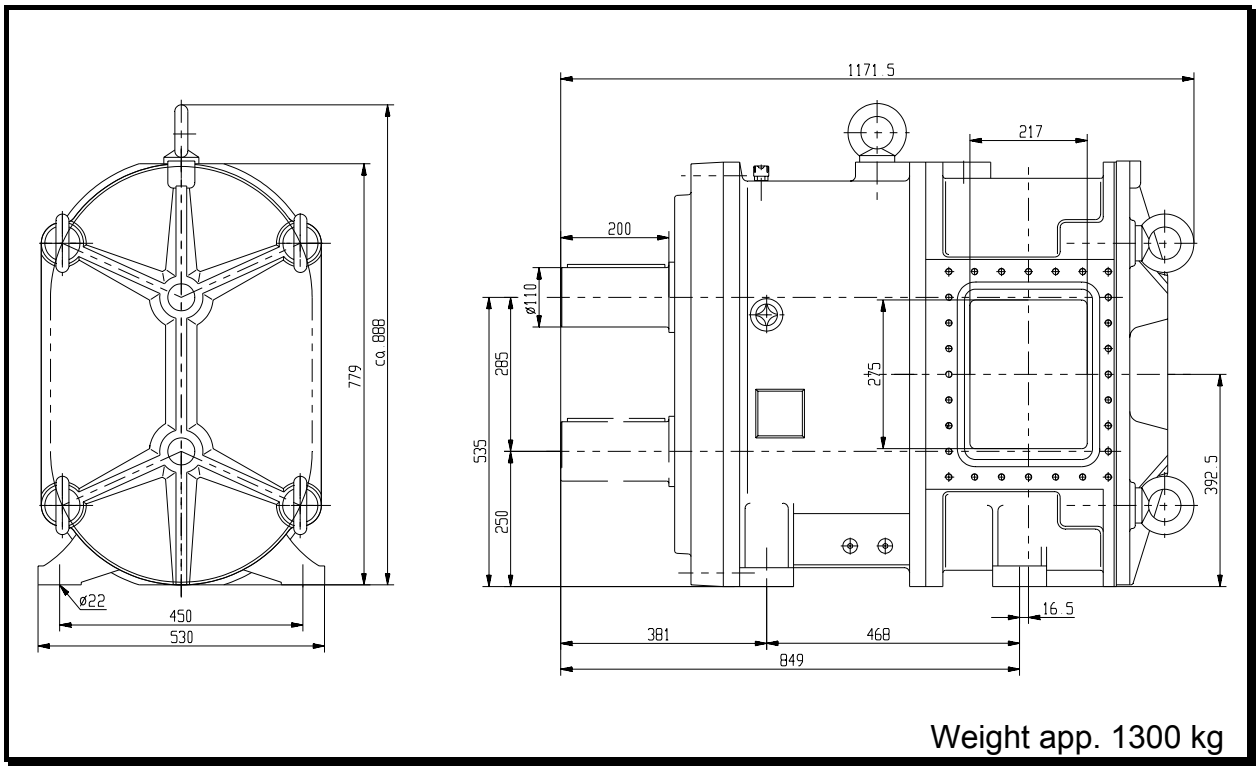


Die Kennlinie bezieht sich auf Wasser, 18°C

BÖRGER®

XL Series

XL 2650

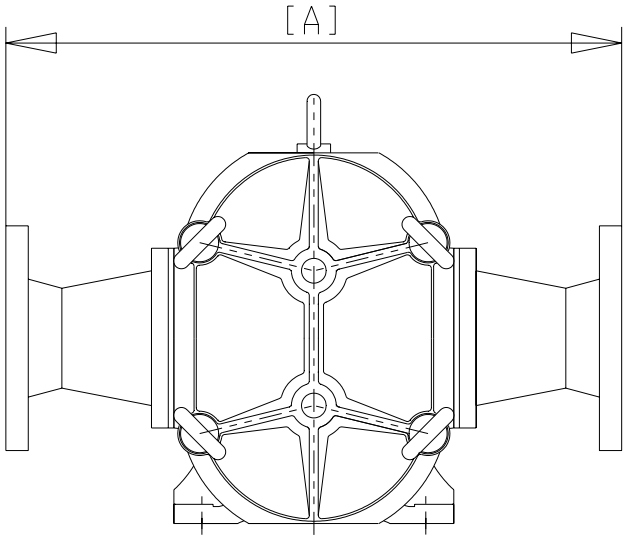


Weight app. 1300 kg

Measure above flanges [A]

FL 1540	DN 200 [mm]	DN 250 [mm]	*DN 300 [mm]	DN 350 [mm]	DN 400 [mm]
DIN 2633	-	-	1070	-	-

* Standard flange



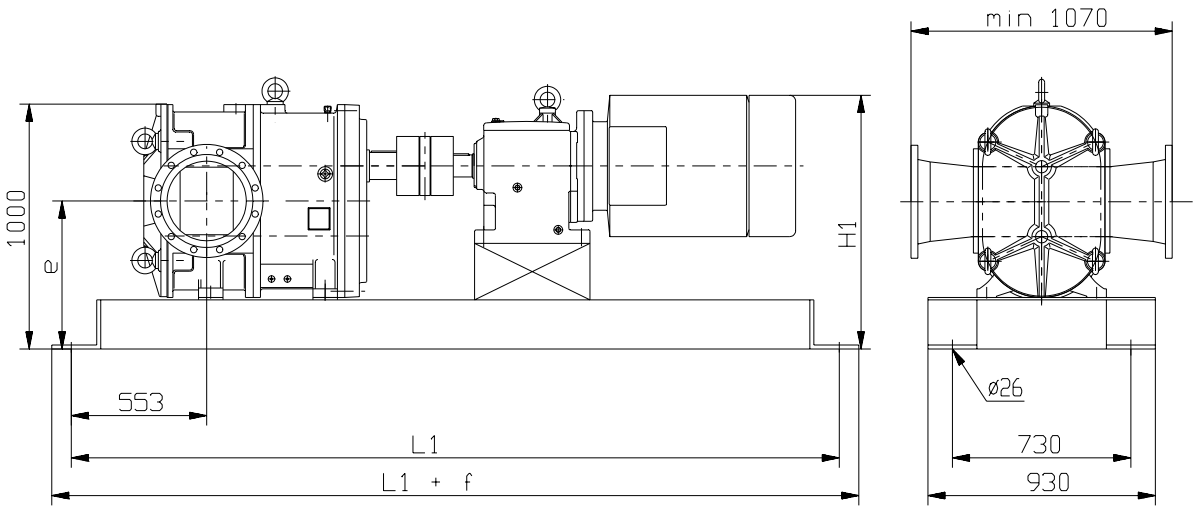
Dimensions may differ due to production reasons!

BÖRGER®

XL Series

XL 2650

front side arrangement



Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	e [mm]	f [mm]
75	ca. 2700	3140	1033	602,5	160

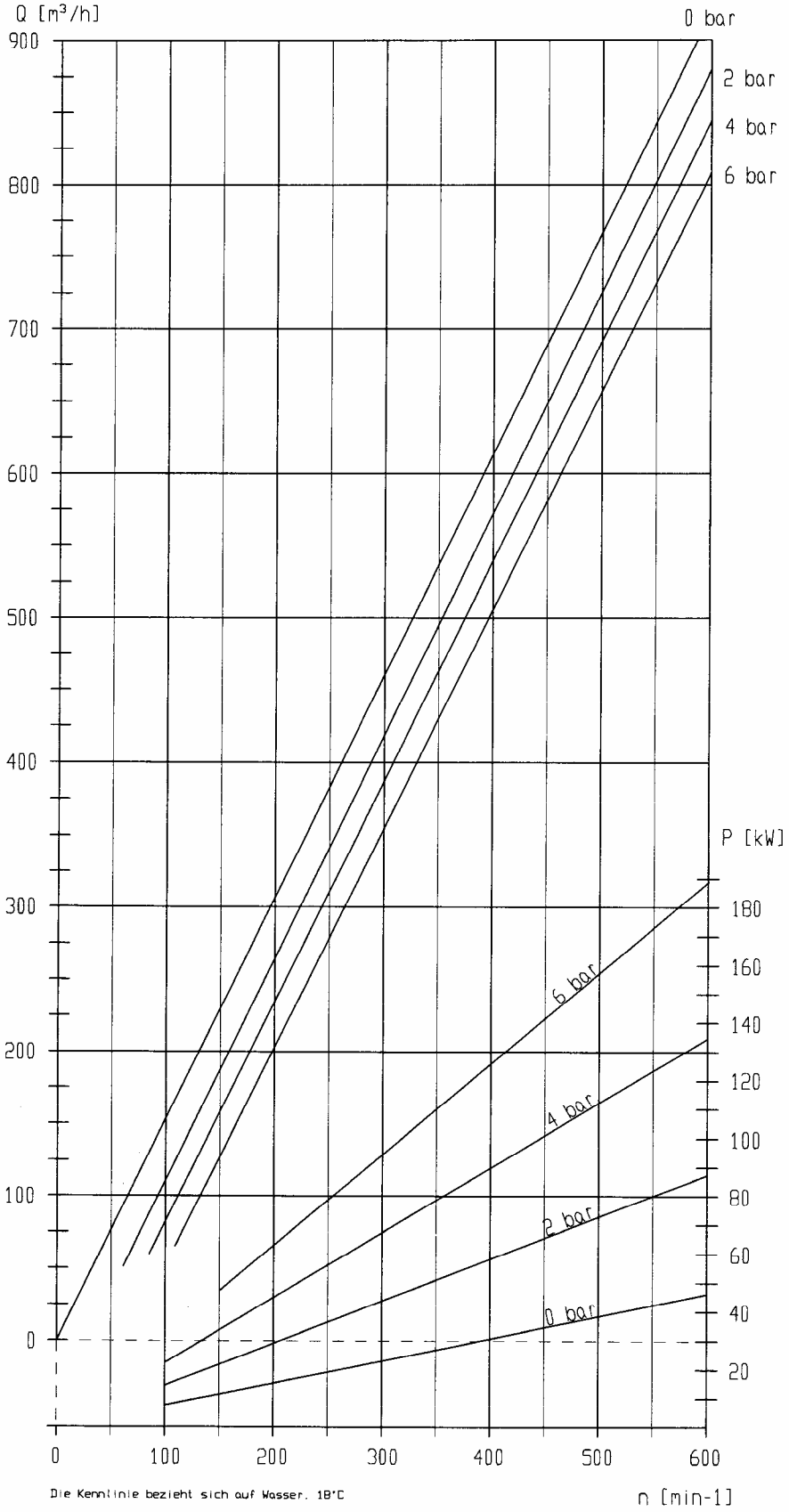
Dimensions may differ due to production reasons!

BÖRGER®

Baureihe XL

XL 2650

Kennlinie

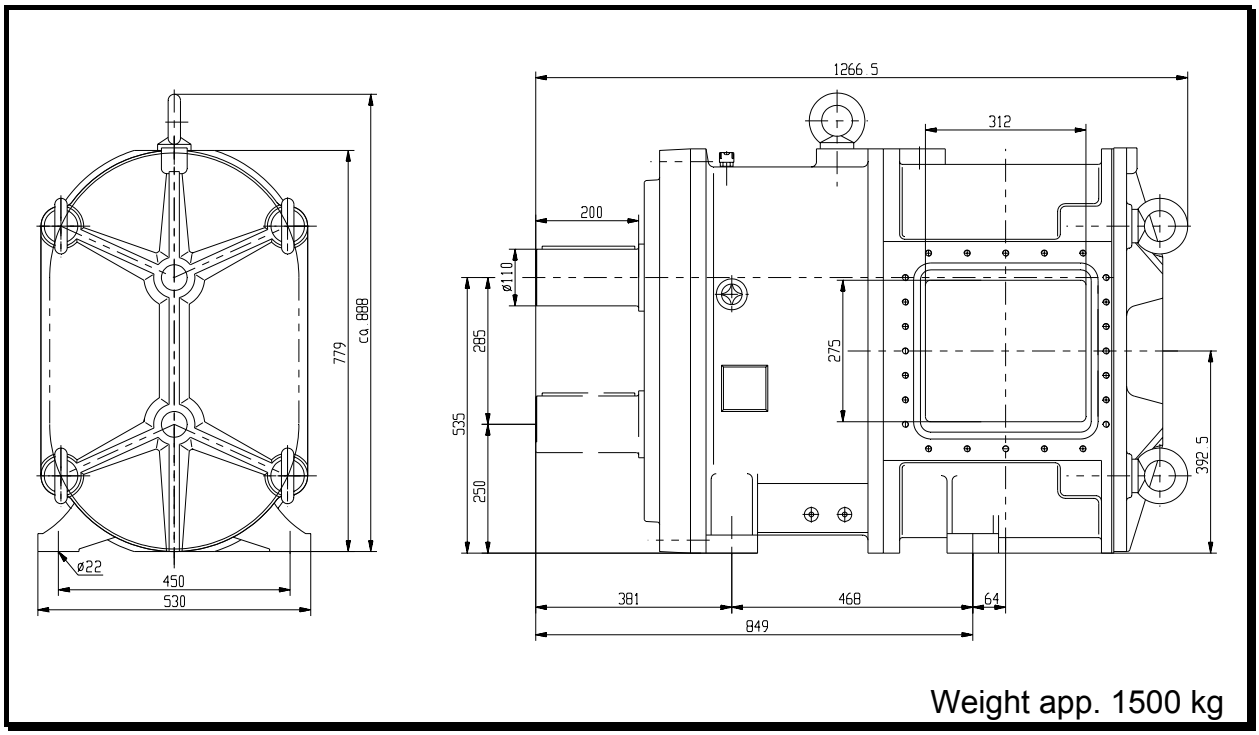


Die Kennlinie bezieht sich auf Wasser, 18°C

BÖRGER®

XL Series

XL 3530

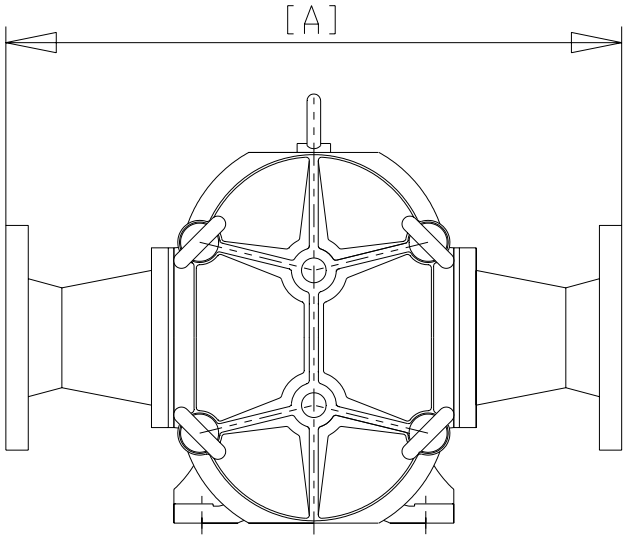


Weight app. 1500 kg

Measure above flanges [A]

FL 1540	DN 200 [mm]	DN 250 [mm]	DN 300 [mm]	*DN 350 [mm]	DN 400 [mm]
DIN 2633	-	-	-	1070	-

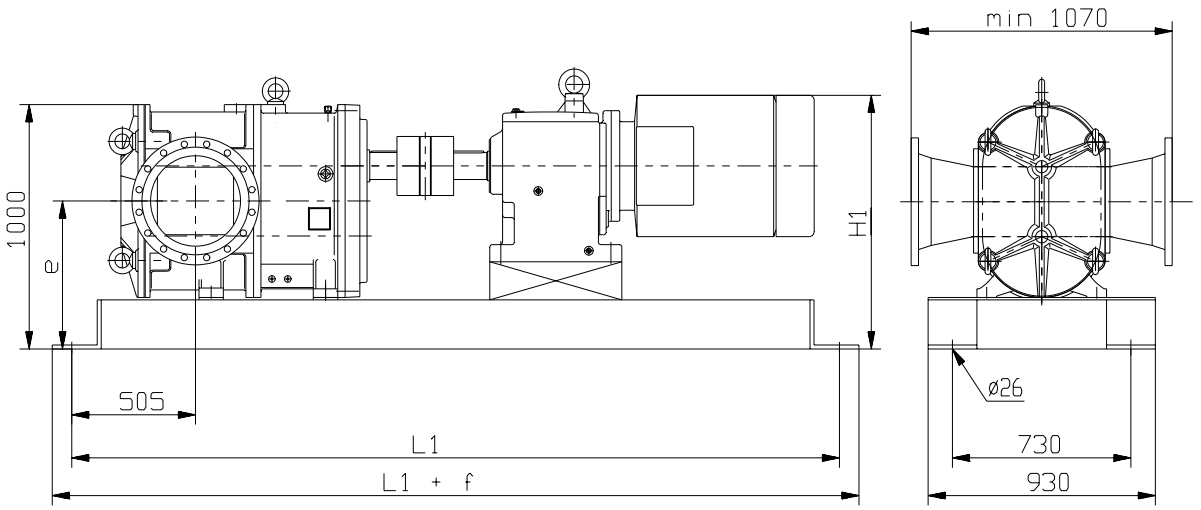
* Standard flange



Dimensions may differ due to production reasons!

XL 3530

front side arrangement

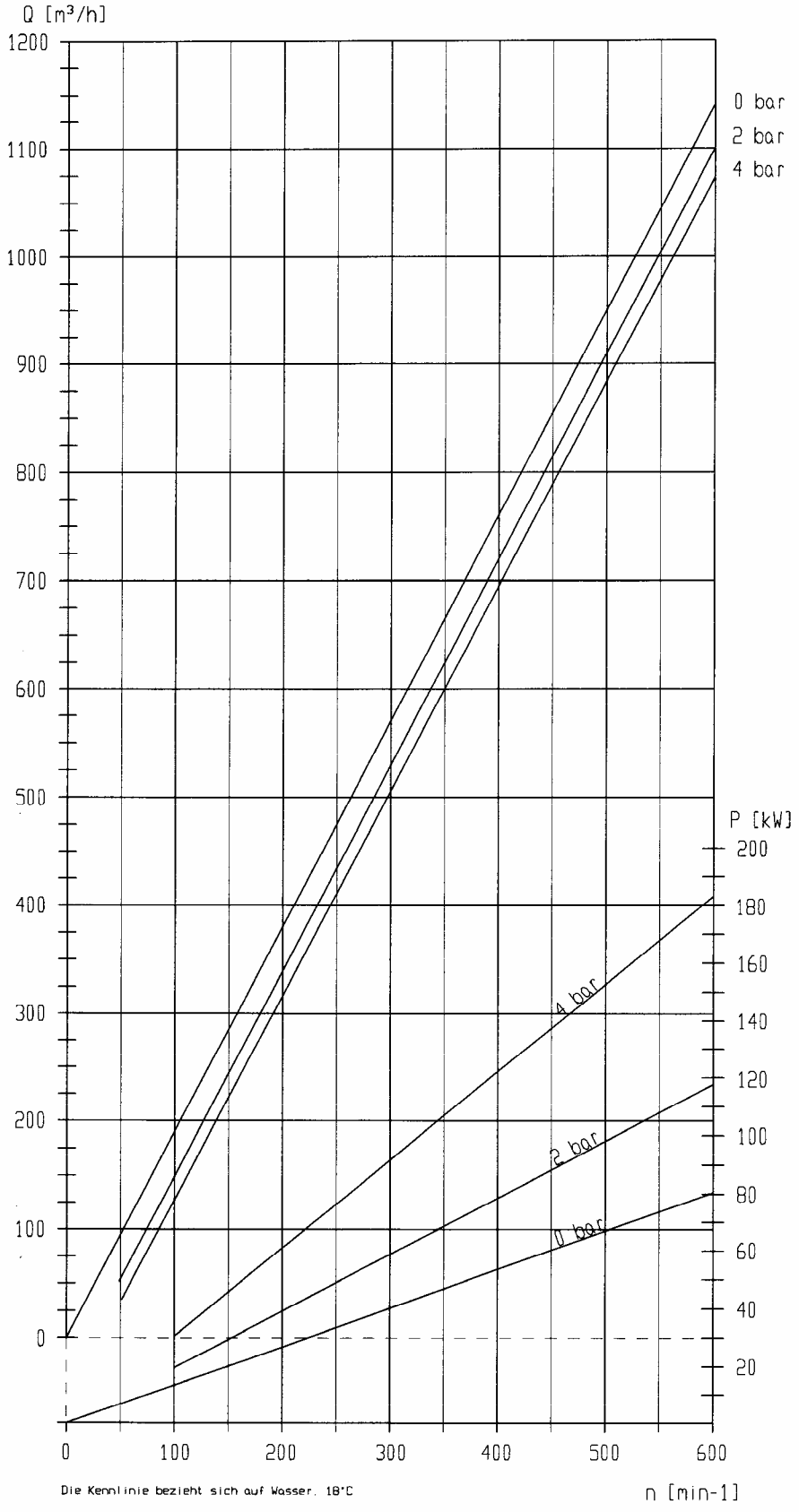


Drive	Weight	Dimensions			
[kW]	[kg]	L1 [mm]	H1 [mm]	e [mm]	f [mm]
90	ca. 3000	3140	1033	602,5	160

Dimensions may differ due to production reasons!

XL 3530

Kennlinie



Die Kennlinie bezieht sich auf Wasser, 18°C

9

The Börger Multicrusher

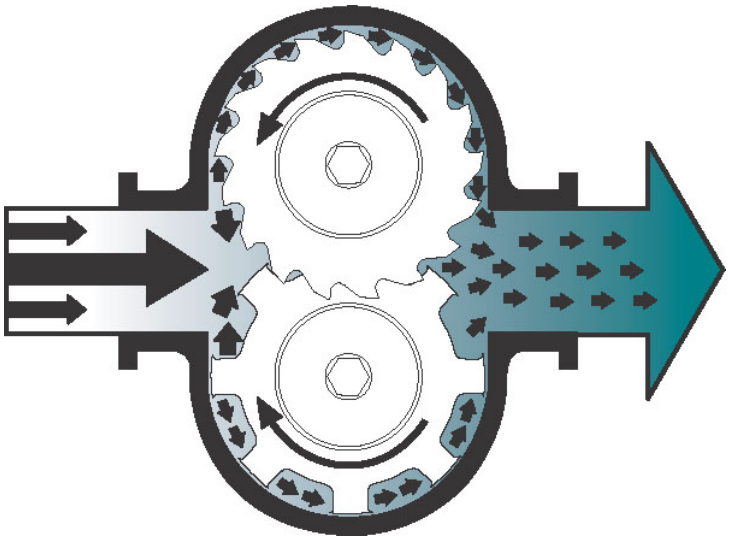
The BOERGER Multicrusher

The Multicrusher is an effective, widely applicable dual-shaft macerating unit for reducing solids in liquids. It chops solids like fibres, wood, glass, plastics, skins, textiles or similar.
It incorporates the same unique advantages of the Boerger MIP-Design as the Boerger Rotary Lobe Pumps: Shafts, bearings, seals and casing parts are identical.

The Boerger Multicrusher is used in many industries. Especially where solids create problems in the manufacturing or operating procedure and need to be reduced to no more critical dimensions. With such treatment of the fluids the following machines and pumps are protected

1. Features

The Function



Two parallel shafts are rotated via an external gear in opposite directions. Each of the both shafts is equipped with cutter blades, meshing each other. The cutter blades pull-in the solids in the liquid and chop it, while the liquid flows through the gabs between the knife blades and between the teeth. The knife blades mesh each other with minimised clearance and though optimised tearing and cutting effect.

The relative rotation speed of the two shafts ensures an optimized macerating effect and prevents stringy material from wrapping around the blades and cutters.
With five different sizes, variable knife blade combinations and optimized rotating speeds this machine can be adapted to almost any application.
Different materials – also for corrosive fluids – allow the use of the Boerger Multicrusher even in combination with seawater.

Flow Rates
Boerger Multicrushers are available for flow rates up to 300 m3/h, depending on the solids content and the kind of solids. From five different sizes we can select the most suitable machine to meet our customer's requirements.

Direction of Flow
The absolute symmetrical design allows the reversion of the direction of flow – in any application - by simply turning the knife blades and the direction of rotation.

Trouble-free Operation
The large direct inlet opening ensures an easy entrance of high viscous products or liquids with rigid, bulky solids. Although the product passes a short way through the Multicrusher the solids are caught and securely chopped down. The different relative circumference rotation speed of the knife blades increases the cutting effect and ensures a self-cleaning in case of soft and sticky solids.

Space Requirement
As a result of their compact but robust design Boerger Multicrushers can be installed in confined spaces. Various flange configurations and different drive arrangements are designed for the individual local conditions and specific requirements.

The Carrier Gear
The knife blades on the non wetted carrier shafts with pushed-on hexagonal sleeves are guided by two spur gear wheels for high operating accuracy to permit a partially dry operation of the machine. The carrier gear is a separately sealed independent unit. High quality gear wheels ensure an even, smooth operation and a long service life.

One side Bearings
The shafts of the Boerger Multicrusher are guided in large dimensioned roller bearings. The bearing assembly is separated from the wetted operation chamber and need not to be disassembled for maintenance purposes.

The Knife Blades
The computer controlled manufacturing of the knife blades ensures an exact geometry with optimized tearing and cutting effect in each combination. This allows the adaptation to each specific application and later conversion is easily possible, too. The materials are selected according to the chemical and physical characteristics of the products.

The BLOCK Casing

The Multicrusher casing is identical with the pump casing and made from a single casting, with small tolerances. It is available from high quality grey cast iron, ductile iron or stainless steel. Both axial faces have replaceable liners to reduce the wear and the spare part costs. The Multicrusher casing can be surface-hardened to make it more wear resistant. The wetted casing is closed by a quick-release-cover, fixed and tightened by four ring nuts only, to allow a quick access to the interior.

The Ease of Maintenance

MIP = Maintenance in Place. The Boerger Multicrusher design with its one-side bearing arrangement allows for quick direct access to the wetted operation chamber. The knife blades and all other wear parts can be replaced within minutes, without disassembling the machine or removing the inlet and outlet piping. The knife blades and the intermediate distance rings are simply pushed on to hexagonal sleeves. The customer's personnel can perform maintenance easily and quickly, which reduces downtime and maintenance costs to a minimum.

The Seals

High quality mechanical seals seal the Multicrusher shafts. In all cases the design and the selected materials are compatible with the specific application.

The Fluid-filled Intermediate Chamber

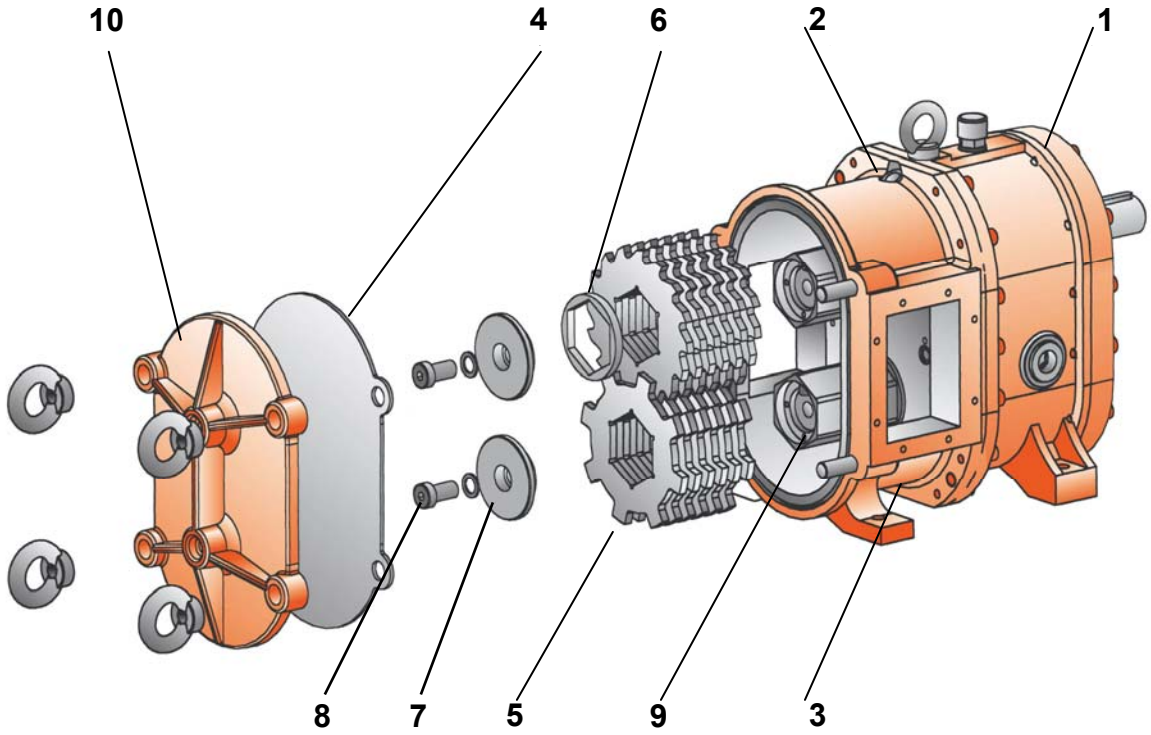
An intermediate chamber - fluid-filled as standard - is located between the operation chamber and the carrier gear. The purpose of this chamber is to prevent product penetration into the carrier gear in the event of a seal failure and to provide an indication of the seal failure. The fluid quenches the mechanical seals and lubricates the sleeve-shaft connection to keep it free from any corrosion.

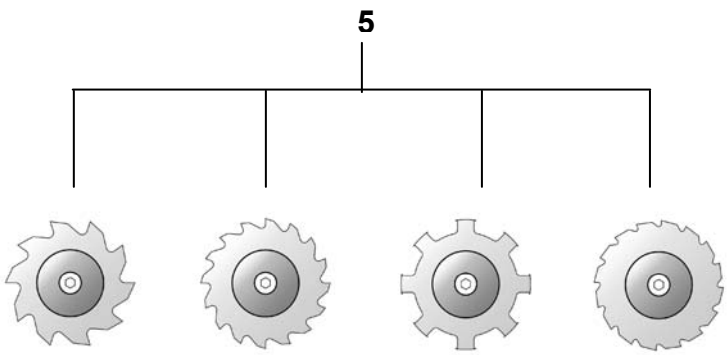
The Drive

Multicrushers are driven by helical geared motors as standard. If required, we are also able to supply variable speed geared motors, combustion engines and hydraulic or pneumatic-motors. Even submersible motors are possible. Multicrusher and drive are connected via an elastic coupling and fitted on a common torsion rigid base frame.

Components of the BOERGER Multicrusher

1. Carrier Gear
2. Quench- and Intermediate Chamber
3. Casing in Block design
4. Axial Casing Liners
5. Cutting- and Counter Blades
6. Distance Rings
7. Sealing Discs
8. Central Fitting Screws
9. Non-wetted Shafts Hexagonal Sleeves
10. Quick-release Cover





The Boerger Multicrusher is an effective, widely applicable macerating unit based on the proven design of the Boerger Rotary Lobe Pump. For details please refer to the identical components in chapter 2.

1. Carrier Gear

The carrier gear is in a separately sealed construction element. The high quality and robustly designed gear wheel ensure a precise transmission and long service life.

2. Quench- and Intermediate Chamber

The fluid-filled and separately-sealed intermediate chamber divides the carrier gear from the wetted operation chamber. It protects the gear from penetration of liquid and the operation chamber from contact with gear oil. It is also the seal quench.

3. BLOCK-Casing

The wetted Multicrusher casing is made from a single BLOCK-casing with low tolerances. It is available from high quality grey cast iron, ductile iron or stainless steel. A quick release cover fitted with just four ring nuts closes the casing. This allows an easy and quick access to the inner parts of the machine.

Large direct inlet / outlet openings for continuous flow, even with large solids and high viscosities.

4. Axial Casing Liners

Axial casing protection liners are fitted as standard at both face ends of the wetted Multicrusher casing. The liners are made from hard metal, hardened steel or specially treated stainless steel. The front side clamped in liner between the casing face and the quick release cover as well as the screwed-in rear plate is easily accessible because of the quick release cover.

All parts without exceptions that are subject to wear are accessible and replaceable through the quick release opening. The Multicrusher needs not to be dismantled for inspection or maintenance.

So a consequent **MIP = Maintenance in Place** is ensured.

5. Cutting- and Counter Blades

Different knife blades and combinations are available for a best possible adaptation to each individual application.

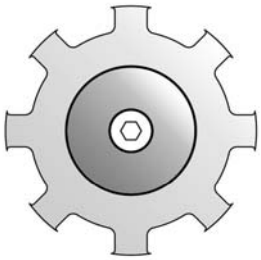
Knife G10Z, coarse with 10 teeth – preferred for pull-in and chopping of very large solids.

Knife F16Z, medium teething with 16 teeth, for achieving a good macerating effect. Also suitable for stringy materials.

Knife G8Z, coarse with 8 teeth, preferred as counter knife in combination with one of the knife blades described above.

SF16Z, very fine teething with 16 teeth. To be used for extraordinary chopping requirements.

Typical Combinations



G10Z combined with G8Z for pre-macerating of re-growing raw material, being fed into Biogas plants for digestion.

F16Z combined with G10Z for chopping of slaughterhouse wastes in a huge plant for slaughtering pigs.

SF16Z combined with F16Z for macerating and homogenisation.

6. Distance Rings

Distance rings fitted between the knife blades ensure the exact clearance for perfect meshing of the blades with best possible cutting effect. The materials are adapted to the individual application.

7. + 8. Sealing discs and Central Screws

The sealing discs with the central screws build the front side locking and allow the easy access to the knifes with easy maintenance.

9. Non-wetted shafts with Hexagonal Sleeves

Based on the design of the Boerger Rotary Lobe Pump the shafts of the Multicrusher are not wetted, too and are made of the same strong material.
The pushed-on hexagonal sleeves are made from fluid adapted materials and allow easy assembly and disassembly of the knife blades.

10. Quick Release Cover

The robust design of Boerger Multicrusher with one side bearings as a matter of principle allows the quick release cover with the best access possible to all parts being wetted and subject to wear. All of these parts can be easily inspected and simply be replaced if needed.

After removing just four ring nuts the quick release cover can be taken off, which makes maintenance easy.
For any replacement of worn parts the Multicrusher does not need to be separated from the system. Even the inlet and outlet pipe connections remain fitted. There is no need for removable pipe pieces or spacer couplings in connection with Boerger Multicrushers.

Also for machines with additional shaft support systems in the quick release cover, the additional bearings are integrated into the cover and can be removed together with it. So the huge maintenance advantage of the one side bearing system remains in existence for these Multicrushers, too.

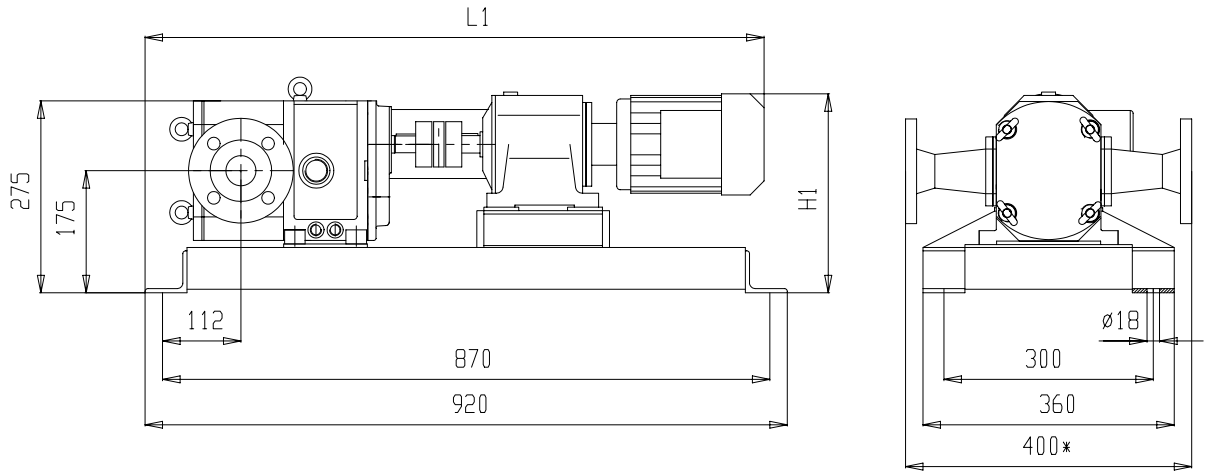
Maintenance friendly in perfection!

MIP = Maintenance in Place

BÖRGER®
Multicrusher

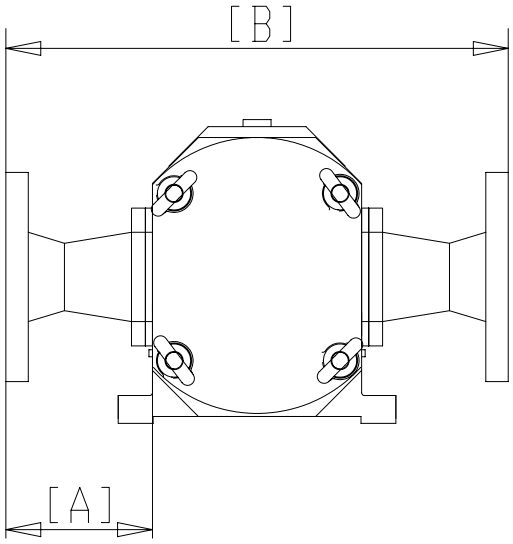
HAL 50

front side arrangement



Drive	Weight	L1	H1
[kW]	[kg]	[mm]	[mm]
1,5	84	818	224
2,2	90	916	245

Measure above single flange [A] / both flanges [B]



Diameter	DIN 2633	ANSI 150
DN 40 [mm]	126/410	146/450
DN 50 [mm]	121/400	140/438
DN 65 [mm]	121/400	146/450
DN 80 [mm]	136/430	156/470

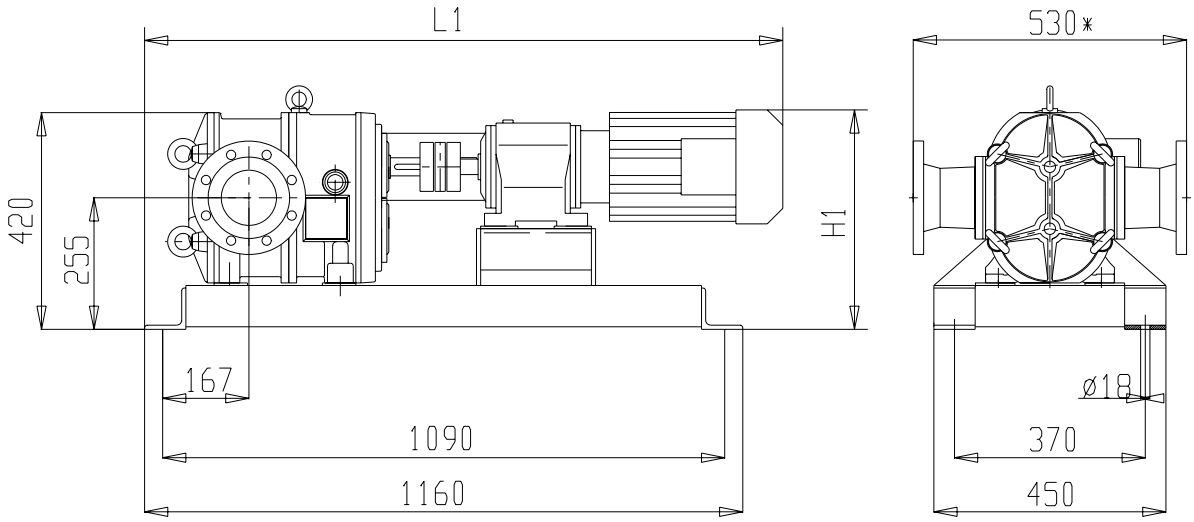
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®
Multicrusher

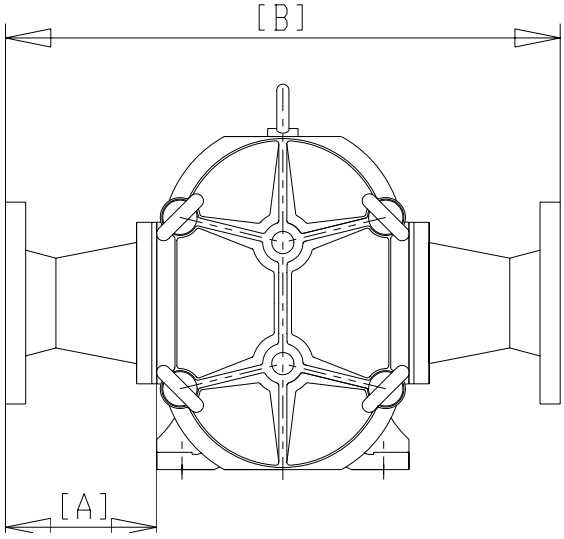
HPL 200

front side arrangement



Drive	Weight	L1	H1
[kW]	[kg]	[mm]	[mm]
3,0	180	1150	414
4,0	205	1176	426

Measure above single flange [A] / both flanges [B]



Diameter	DIN 2633	ANSI 150
DN 100 [mm]	136/530	160/578
DN 125 [mm]	151/560	185/628
DN 150 [mm]	181/620	236/730
DN 200 [mm]	211/682	

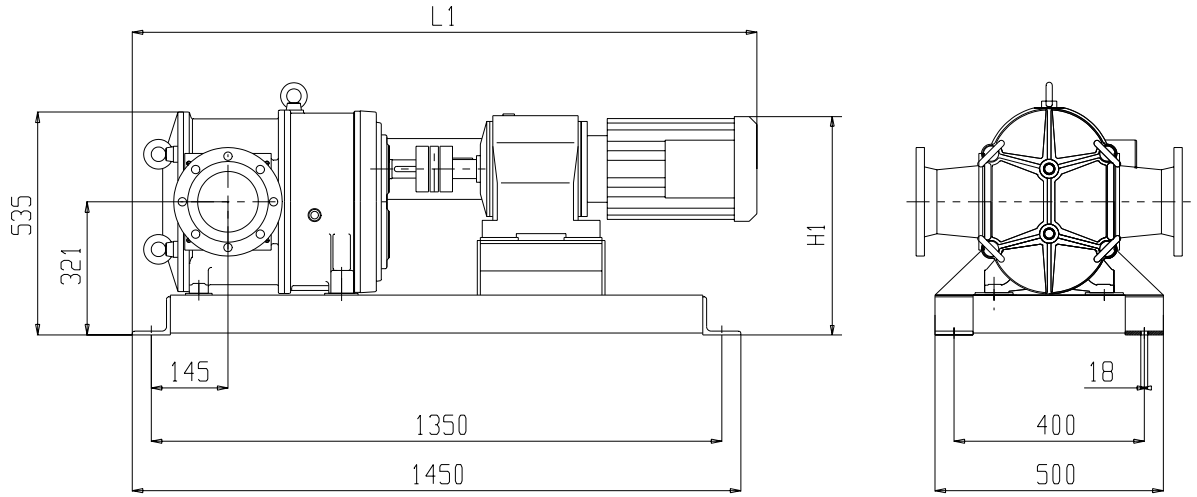
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®
Multicrusher

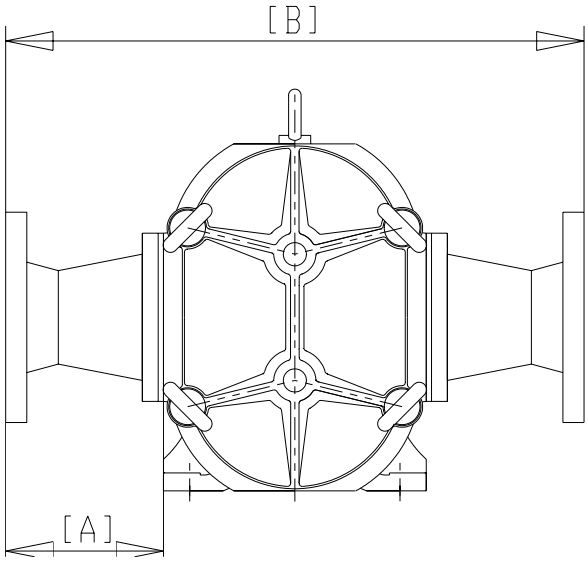
HCL 390

front side arrangement



Drive	Weight	L1	H1
[kW]	[kg]	[mm]	[mm]
5,5	338	1525	530
7,5	368	1525	530

Measure above single flange [A] / both flanges [B]



Diameter	DIN 2633	ANSI 150
DN 100 [mm]	160/615	-
DN 125 [mm]	175/650	194/690
DN 150 [mm]	160/620	200/700
DN 200 [mm]	260/820	-

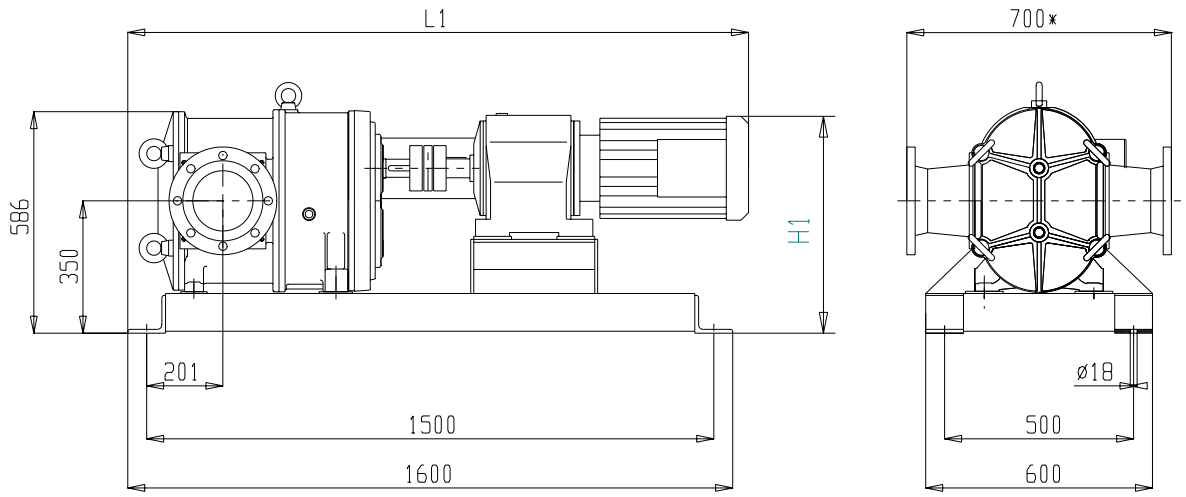
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®
Multicrusher

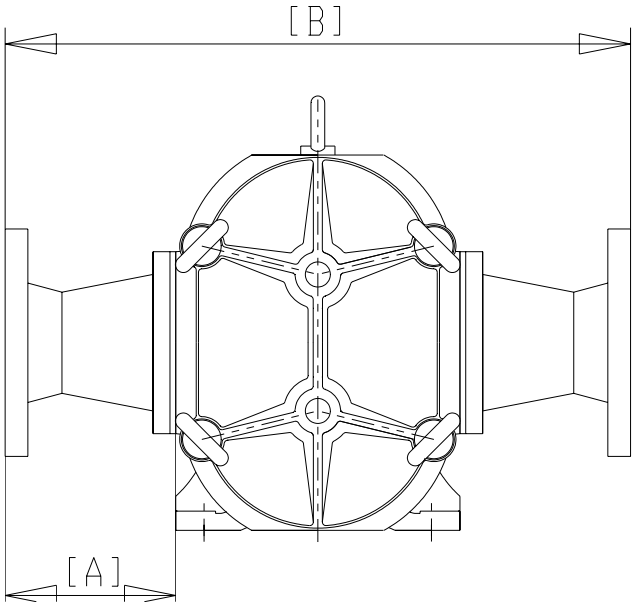
HFL 776

front side arrangement



Drive	Weight	L1	H1
[kW]	[kg]	[mm]	[mm]
9,2	420	1530	574
11	425	1655	574

Measure above single flange [A] / both flanges [B]



Diameter	DIN 2633	ANSI 150
DN 125 [mm]	201/750	200/748
DN 150 [mm]	176/700	232/812
DN 200 [mm]	151/650	291/930

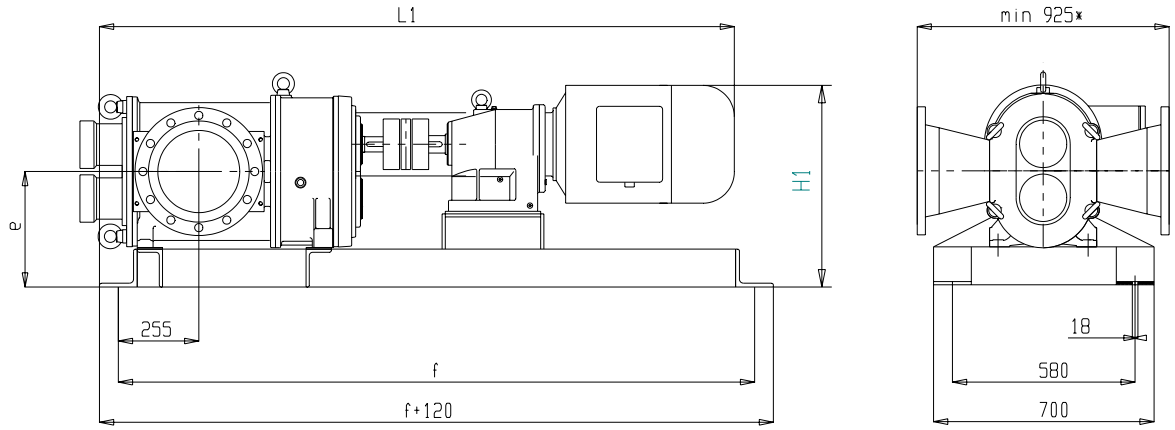
* Standard flange

Dimensions may differ due to production reasons!

BÖRGER®
Multicrusher

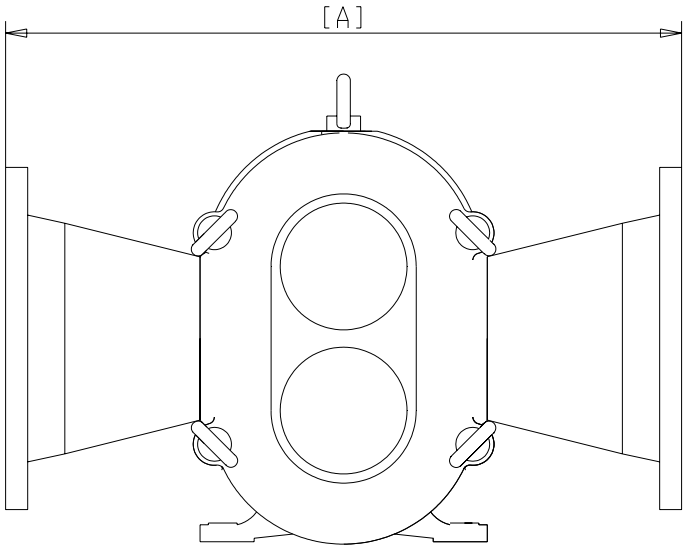
HLA 1540

front side arrangement



Drive	Weight	L1	H1	e	f
[kW]	[kg]	[mm]	[mm]	[mm]	[mm]
18,5	900	2099	618	370	2200
22	918	2099	618	370	2200

Measure above both flanges [A]

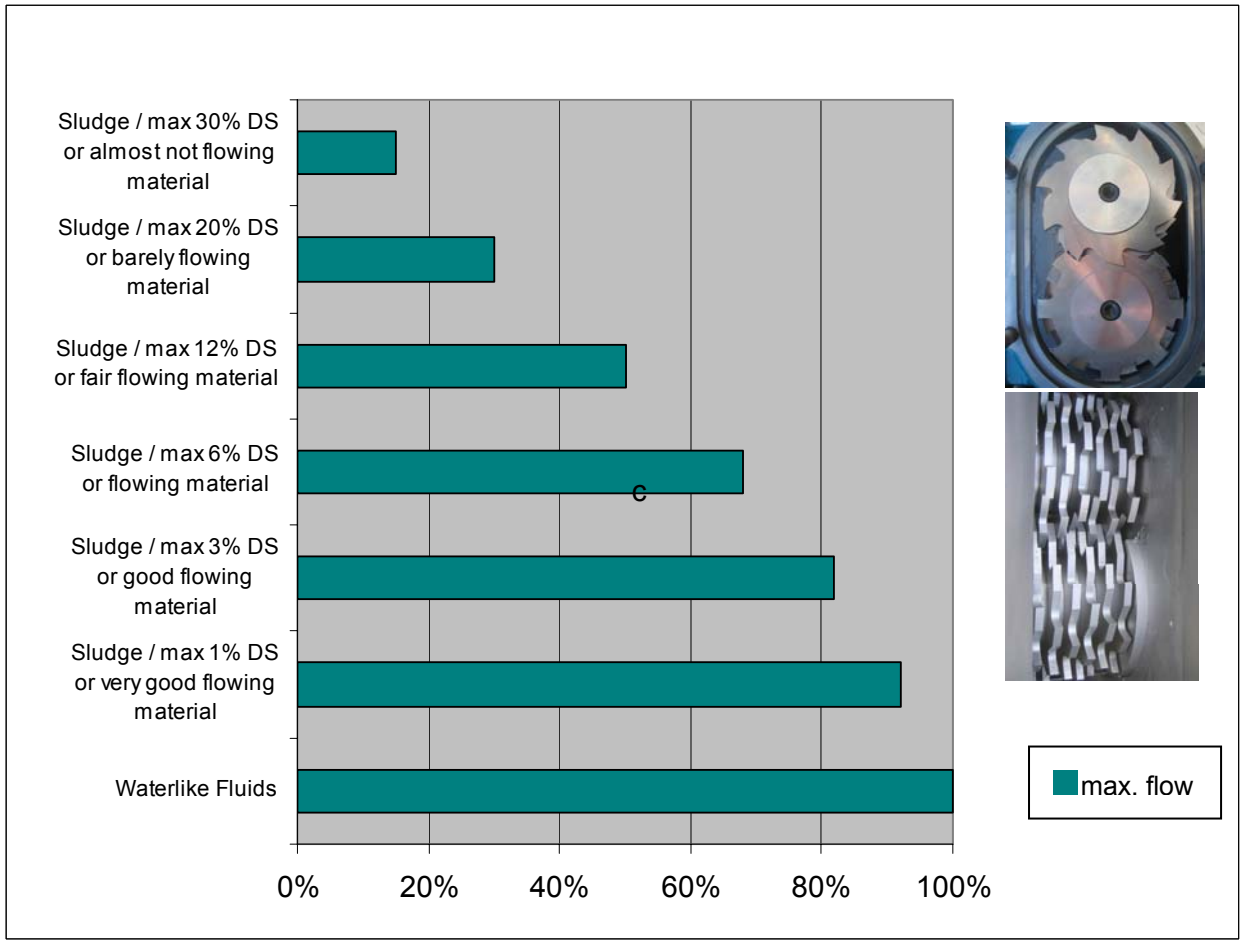


Diameter	DIN 2633
DN 200 [mm]	900
DN 250 [mm]	800
DN 300 [mm]	1000

* Standard flange

Dimensions may differ due to production reasons!

Design Guideline for Börger Multicrusher



The flow capability of the Multicrusher depends on the dry solid (DS) content of the fluid. The higher the DS content, the smaller the capacity, otherwise resistance and therefore pressure drop would be too high through the unit..

Multicrusher Typ	max. Flow	Fluid Velocity
HAL	15 m³/h	1,5 m/s
HPL	60 m³/h	3,0 m/s
HCL	120 m³/h	3,1 m/s
HFL	200 m³/h	3,1 m/s
HLA	310 m³/h	2,3 m/s

Description: Sludge with 12% DS content needs to be macerated. According to the diagram 50% of the max. flow is possible for the Multicrusher.
HAL = 7.5 m³/h; HPL= 30 m³/h; HCL = 60 m³/h;
HFL = 100 m³/h, HLA = 155 m³/h.

Examples:
a) 25 m³/h, 18 % TS = max. 25% → Typ HCL
HAL= 3,75 m³/h, HPL= 15 m³/h, HCL= 30 m³/h, HFL= 50 m³/h, HLA= 77 m³/h
b) 85 m³/h, 4 % TS = max. 60% → Typ HFL
HAL= 9 m³/h, HPL= 36 m³/h, HCL= 72 m³/h, HFL= 120 m³/h, HLA= 186 m³/h

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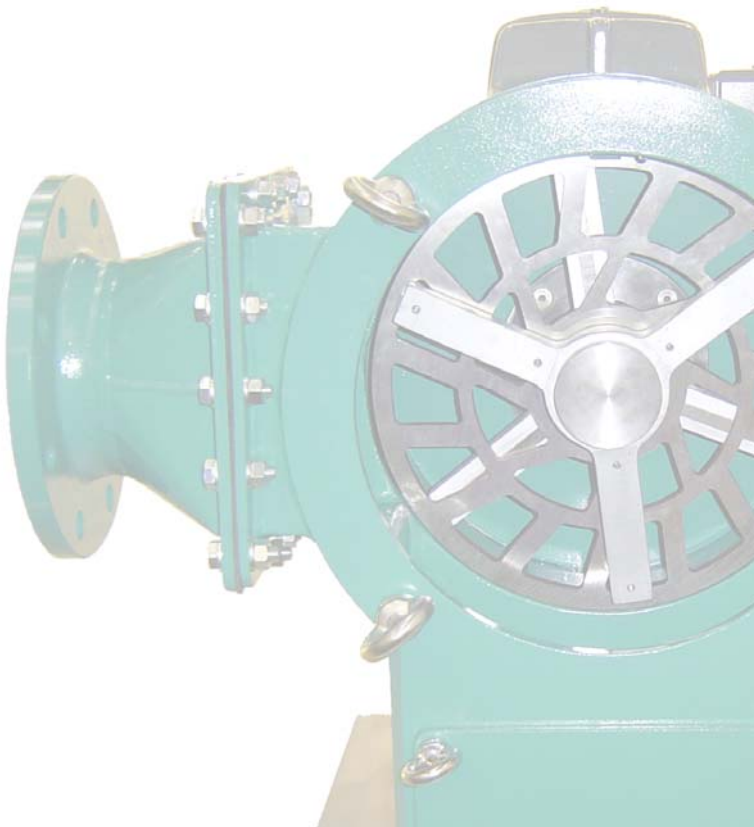
10

The Börger Multichopper I

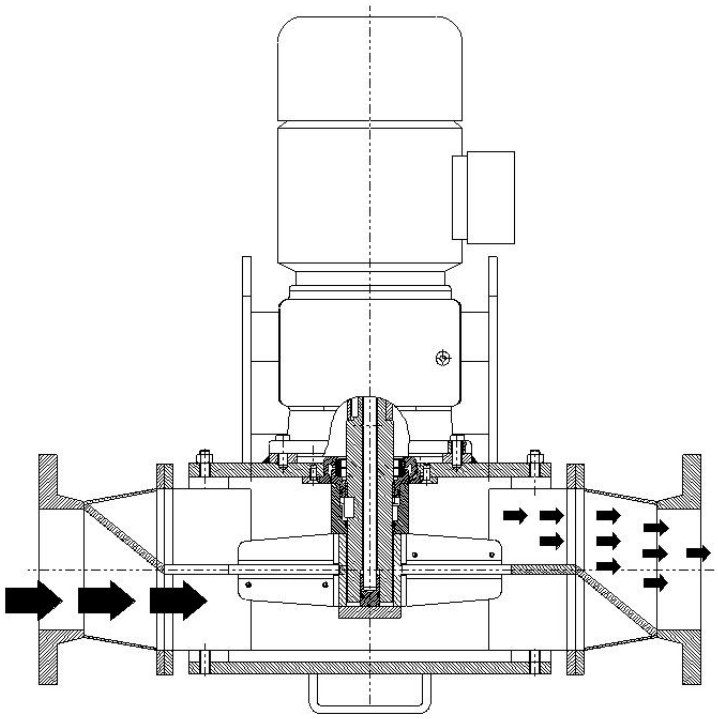


The BOERGER Multichopper

The Boerger Multichopper is a macerator with central cutterplate and twin opposing rotating knifeheads for reducing solids in liquids. It chops down cutable solids. Multichoppers are used mainly in the wastewater treatment technology but in various other industries, too.

1. Features

The Function



The product, consisting of fluid – usually water - with large solids, is conveyed through the openings of the cutterplate with the use of a pump.
The rotating knifeheads on both sides of the cutterplate create six cuts per each revolution ensuring a reliable, trouble-free chopping and reducing of the solids.
The twin opposing rotating knifeheads with triple replaceable knifes each are fitted on gab against each other.
The central adjusting unit with an external clamp construction keeps the assembly axially aligned and allows easy readjusting.

The chopping result is mainly influenced by the design of the cutterplate, the throughput volume and the rotation speed.
Non cutable solids – such as stones or hard metal particles – are separated prior to the entry into the cutterplate and collected in the large debris collection area below, from which they can be easily removed frequently.

The Throughput Volume

The possible throughput volume depends on the solids content of the product and on the individual design of the cutterplate.
With sewage or wastewater having a solids content of app. 3 – 5 % we can allow a throughput flow volume of up to app. 100 m³/h.

The Direction of Flow

The product is conveyed through the cutterplate in the direction towards the drive. With the special design of the reversible flange connections of the Multichopper range I the direction of flow can be determined by the customer. The diameter and standard of the flange connections is adapted to the specific application.

The trouble-free Operation

The combination of a Multichopper with a Rotary Lobe Pump ensures an even and smooth throughput. The two rotating knifeheads at both sides of the cutterplate catch and cut the solids being in the product.

The Space Requirement

The compact design of the Multichopper I allows fitting even in case of limited space. All parts in contact with the product are assessable from outside without disassembling the machine.

The Re-adjusting

Knife to plate tension is adjustable from the outside of the assembly, a central shaft clamp construction keeps the assembly axially aligned and can easily be re-adjusted. The cutterplate is fixed in a radial position between the two knifeheads along the common shaft.

The Cutterplate

There are cutterplates available in different design and from different materials, which are selected according to the individual application.
This allows adapting the chopping degree to the requirements.

The easy Maintenance

MIP = Maintenance in Place. The Multichopper with one-side bearing construction includes technically friendly operational design improvements with easy access to the operational area. In case of need the knifes, the cutterplate and the further product loaded parts can simply be replaced in minutes, without disassembly of the machine or the flange connections. The central adjusting unit allows readjusting from the outside.

The Shaft Seal

The shaft seal is furnished with a proven Boerger recognized high quality mechanical seal with quench and control. The quench ensures lubrication of the seal in all operation conditions and long service life.

The Fluid-filled Quench

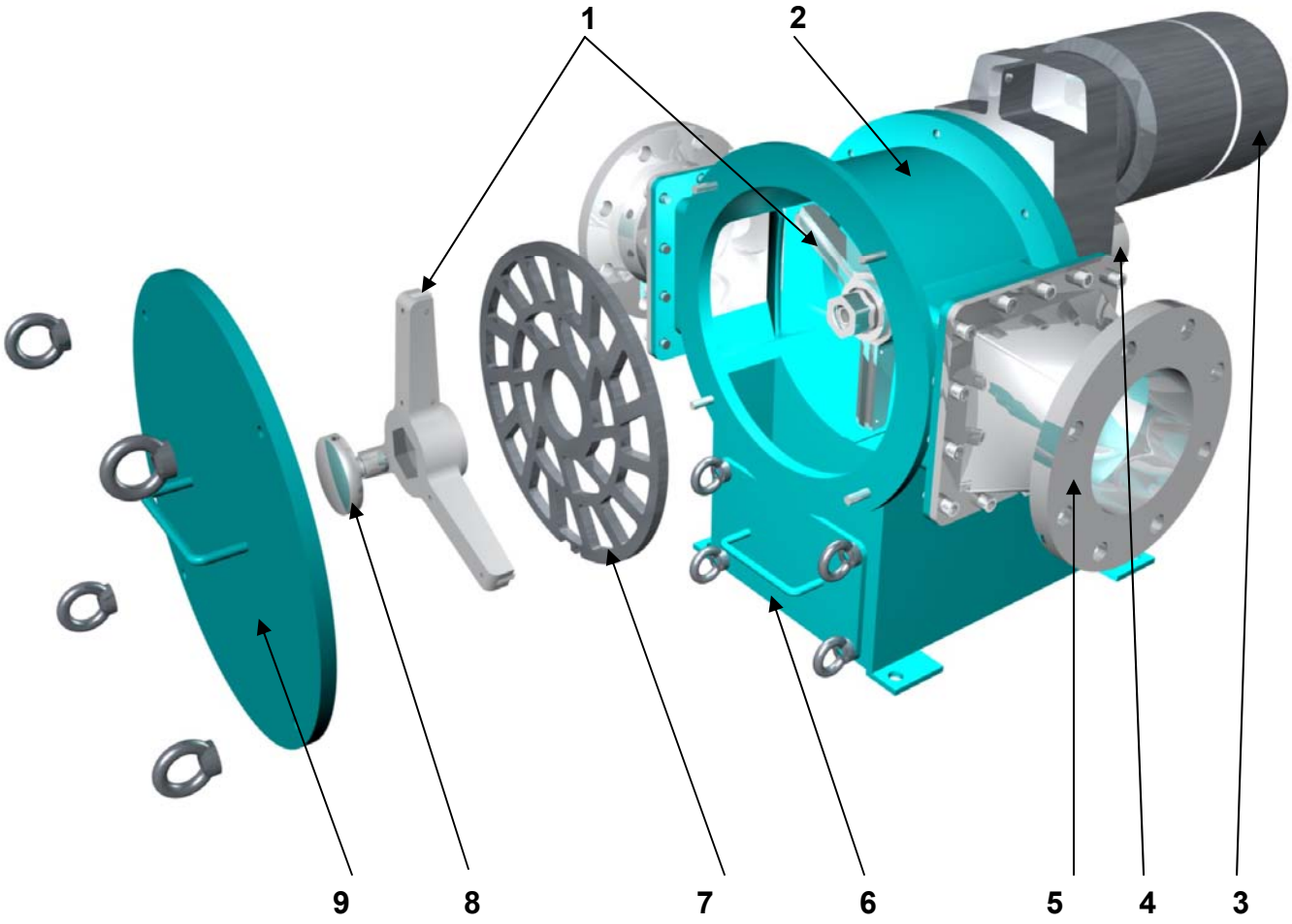
The typical Boerger shaft seal design includes a fluid-filled intermediate chamber between the operation area and the flanged drive unit. This protects the drive from penetration by product and allows easy control of the seal.

The Drive

As standard the Multichopper is driven via a parallel shaft geared motor. As alternative a hydraulic motor drive can be realized.

The Components of the BOERGER Multichopper

1. Both sides triple Knifeheads with replaceable Knifes
2. Casing
3. Parallel Shaft Geared Motor with Hollow Shaft
4. Central Adjusting Unit
5. Reversible Connection Flanges
6. Debris Collection Area
7. Cutterplate
8. Fitting Screw
9. Quick Release Cover



The Boerger Multichopper is a Cutterplate-Macerator in inline-design incorporating the Boerger MIP features. Our customers appreciate the flexibility due to little space requirements and the possibility of changing the direction of throughput by reversing the flanges

1.Triple Knifeheads with replaceable Knifes

In opposite to most other macerators the Boerger Multichopper is equipped with knifeheads at both sides of the cutterplate. With the resulting six macerating cuts per revolution a very good chopping effect is achieved. The knifes are replaceable individually.

2. Casing

The Multichopper-Casing as stabile construction with integrated debris collection area for non cutable solids.

3. Parallel Shaft Geared Motor with Hollow Shaft

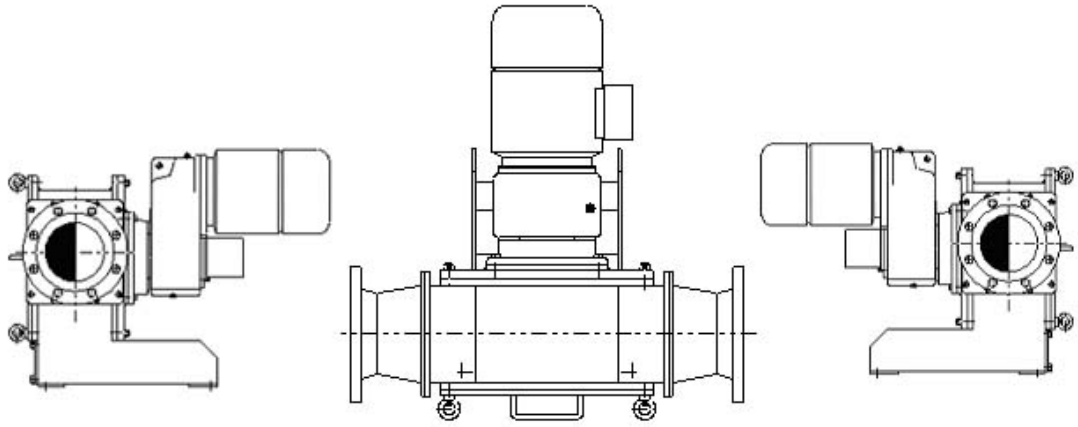
The drive as parallel shaft gear with hollow shaft allows central re-adjusting of the macerating unit via just one central re-adjusting unit.

4. Central Adjusting Unit

Knife to plate tension is adjustable from the outside of the assembly; a central shaft clamp construction keeps the assembly axially aligned.

5. Reversible Flange Connections

Genius design of flange connections. The direction of flow can be determined and changed by the customer by simply reversing the flange connections.
Of course there are different flange diameter and standards available.

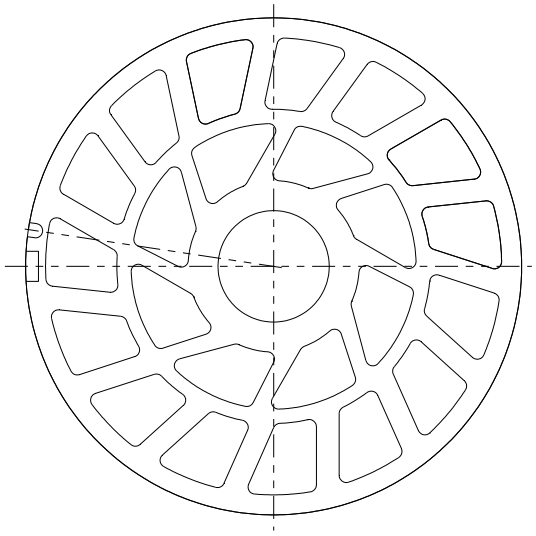


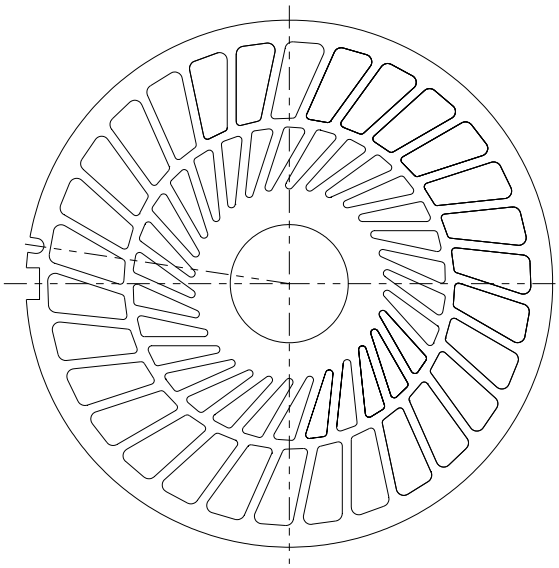
6. Debris Collection Area

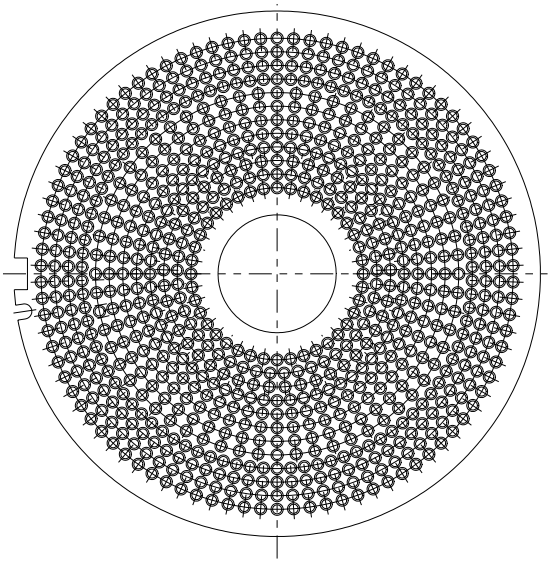
Save separation of non-cutable solids. Stones and metal parts – with higher specific gravity - are collected in the debris area below the cutting unit and can be easily removed through the front cleaning opening.

7. Cutterplate

The cutterplate is fixed in a radial position between the two knife-heads along the common shaft.
Different plate designs are available to adapt to the individual requirements. The hardenend steel material ensures long servive life.







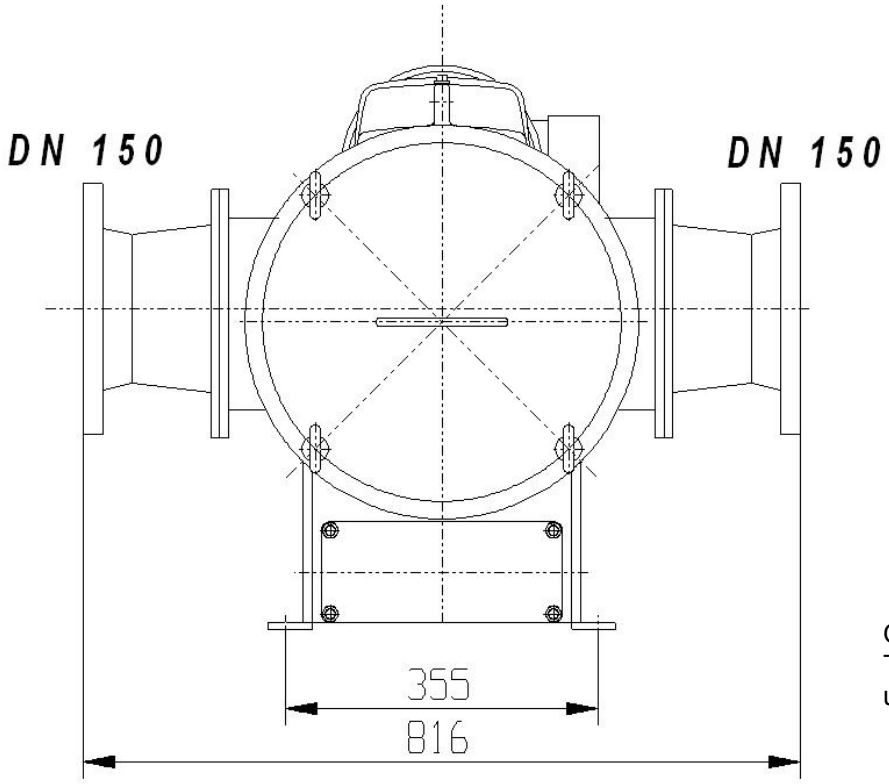
8. Fitting Screw

The fitting screw is the counter parts to the central adjusting unit. It is responsible fort he optimal tension of the knifeheads towards the cutterplate.

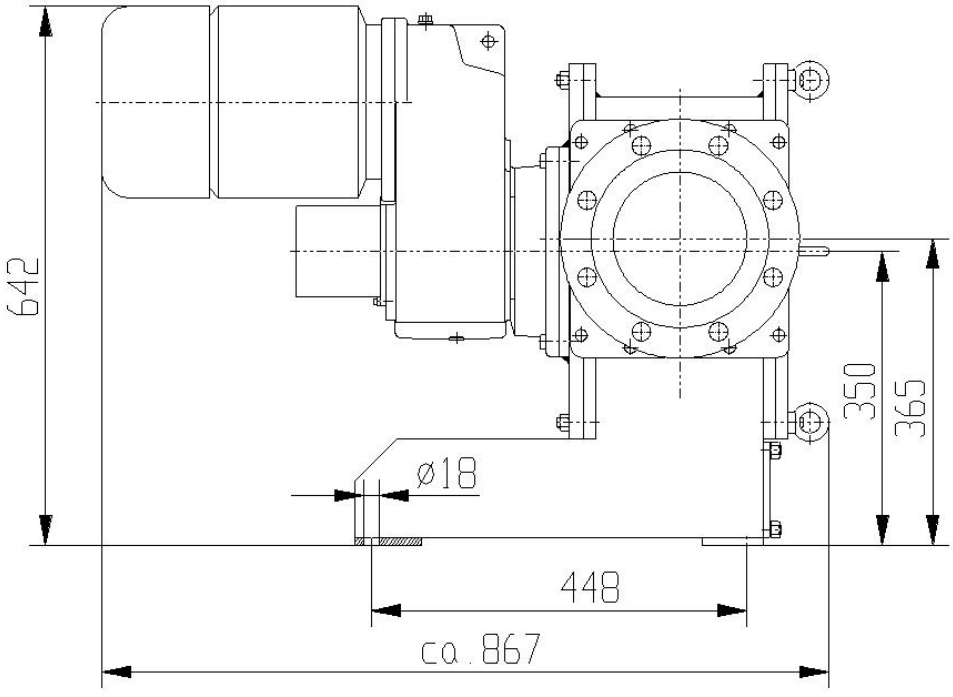
9. Quick Release Cover

After loosing of just four ring nuts the quick release cover can be removed. This makes maintenance quick and easy. For changing of product loaded parts the machine need not to be removed from the system. Even the inlet and outlet pipe connections remain fitted. There is no need of any bypass or dummy for the time of maintenance.

Dimensions of the Multichopper-I:



Other flange sizes are possible,
The width dimension then remains unchanged.



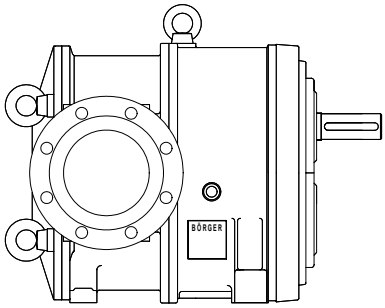
Dimensions may differ due to production reasons!

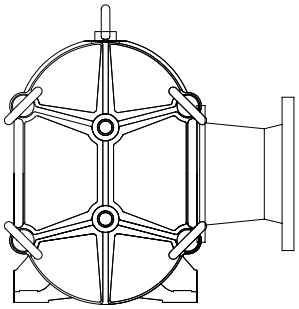
11

Connection Flanges

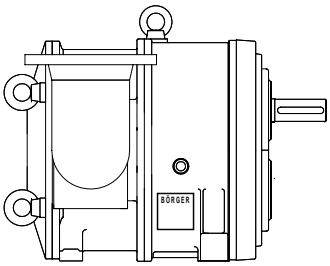
An Extract from our Possibilities:

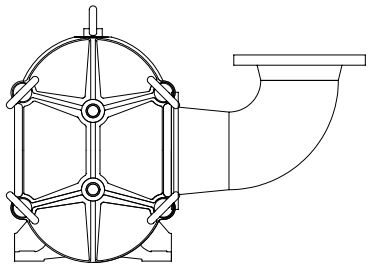
Standard: Transition from rectangle pump connection to standard flange





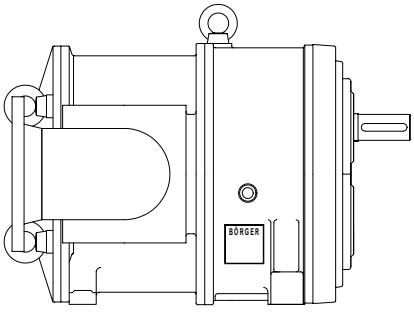
Elbow, flange pointed upwards

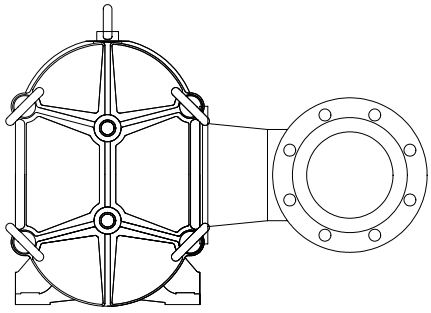




Optional also downwards

Elbow, flange pointed forward

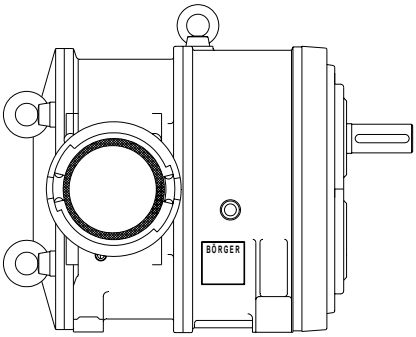


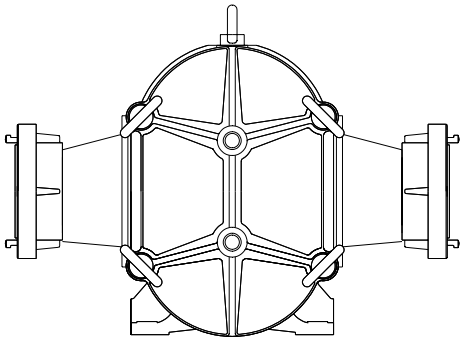


Optional also backwards

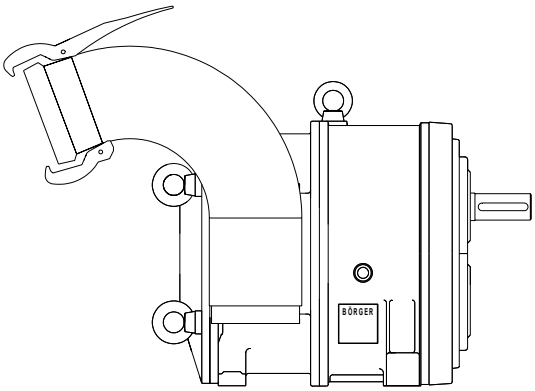
Different flanges connections right and left side are possible.

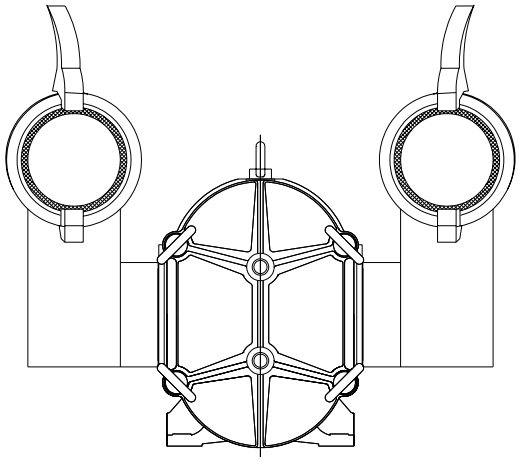
Quick connect coupling, Storz





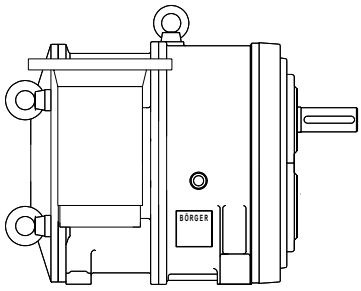
Connection with quick coupling, System Perrot, with female end 4“ to 8“

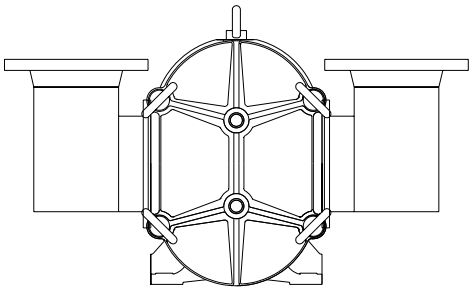




Gooseneck design, recommended with mobile pumps

For space restricted applications

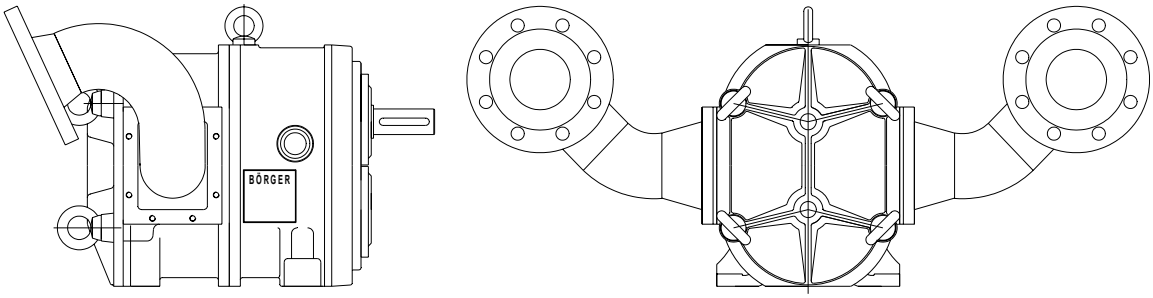




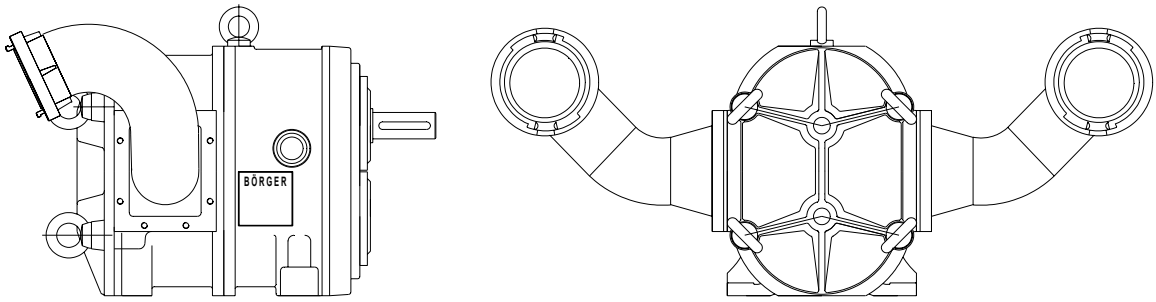
Optional also downwards, forwards and backwards

Different flanges connections right and left side are possible.

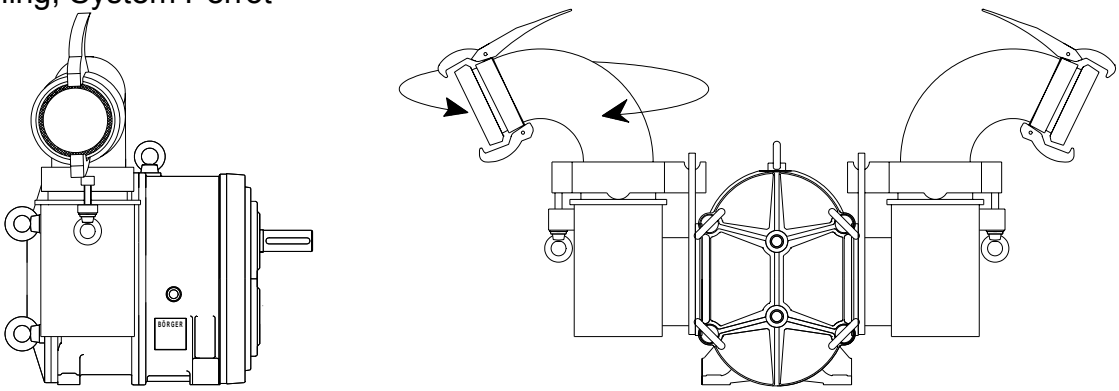
Double elbow, pointed upwards, with flange connection



Double elbow, pointed upwards, with quick coupling connection



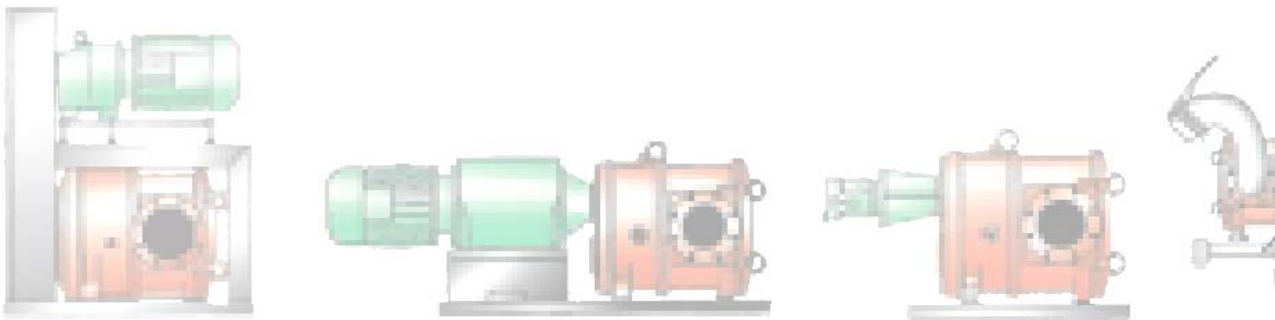
Infinitely variable unlimited twistable suction and discharge connection, with quick coupling, System Perrot



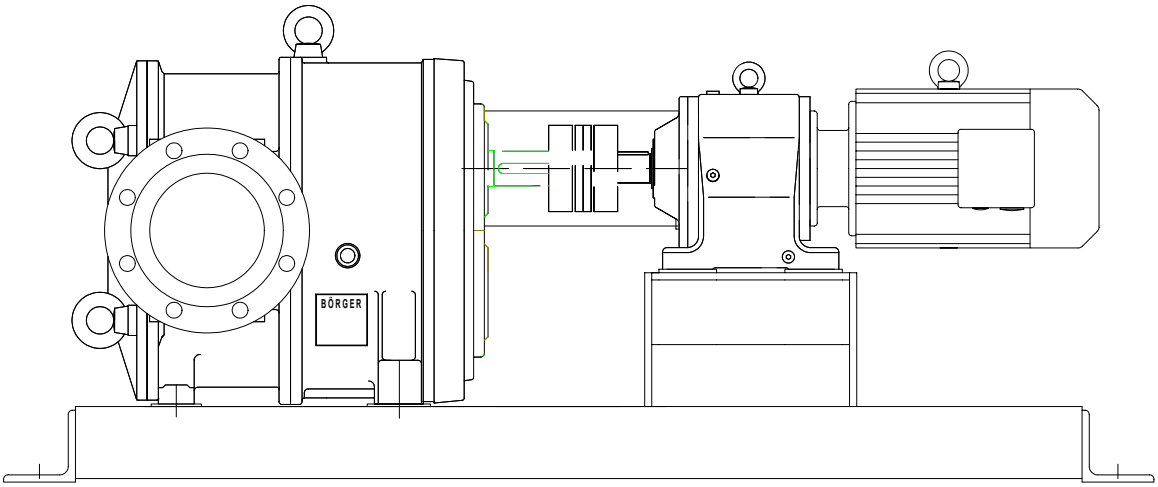
Different flanges connections right and left side are possible.

12

Construction Methods

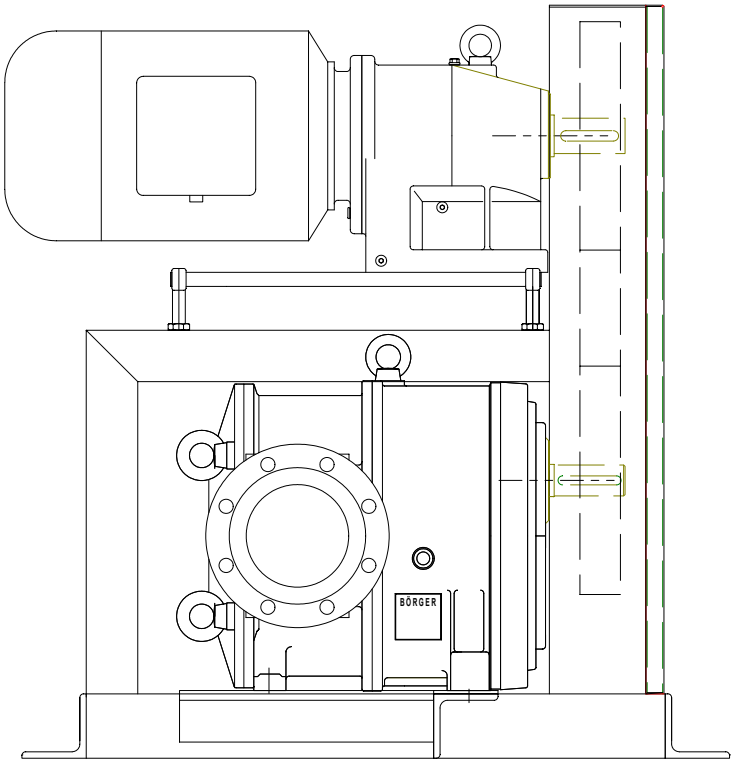


1. Standard Layout



Pump with gear motor and elastic coupling assemble on a high-quality, torsion-resistant, welded and corrosion-proof base frame.

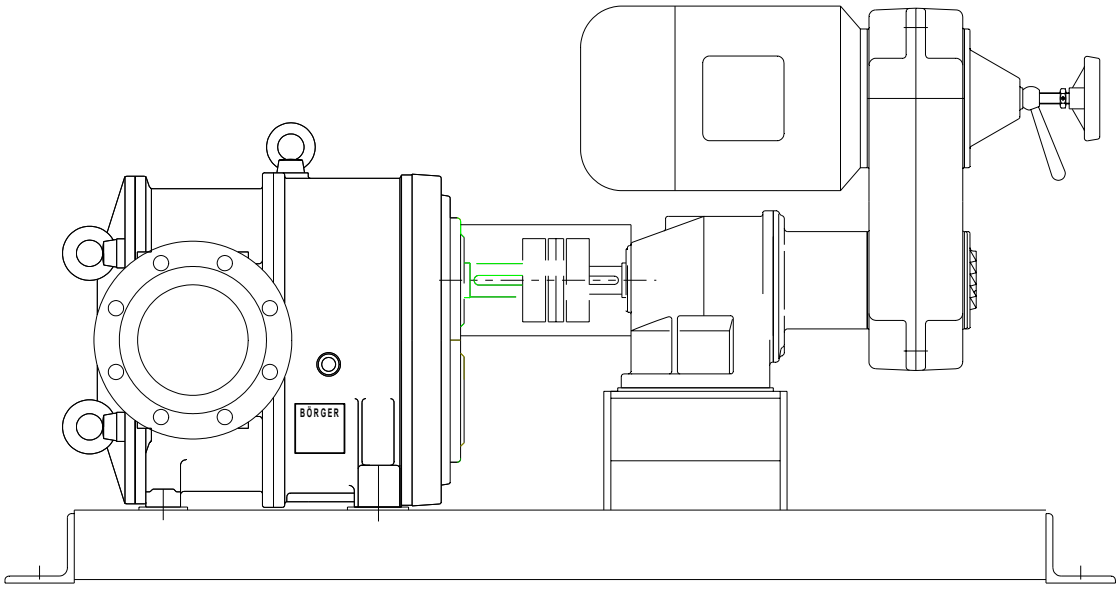
2. Overhead Drive Assembly



Power transmission by toothed belt or V-belt.

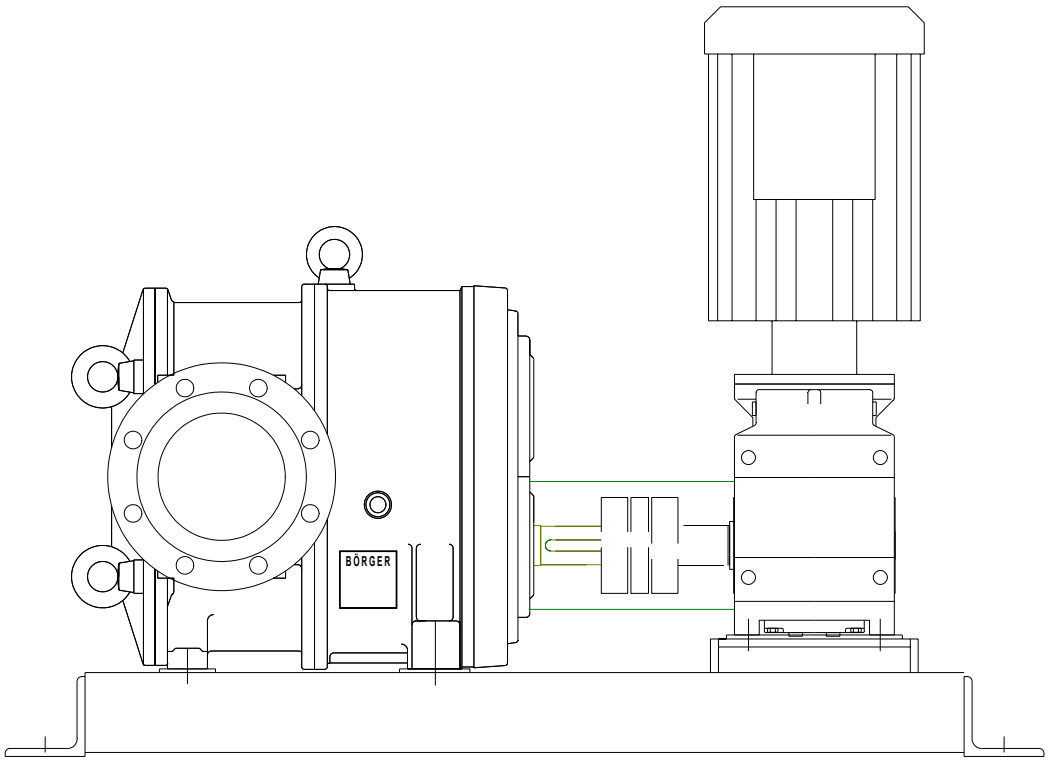
Especially for restricted spaces by means of the space saving arrangement of pump and drive.

3. Mechanically Adjustable Variable Speed Drive



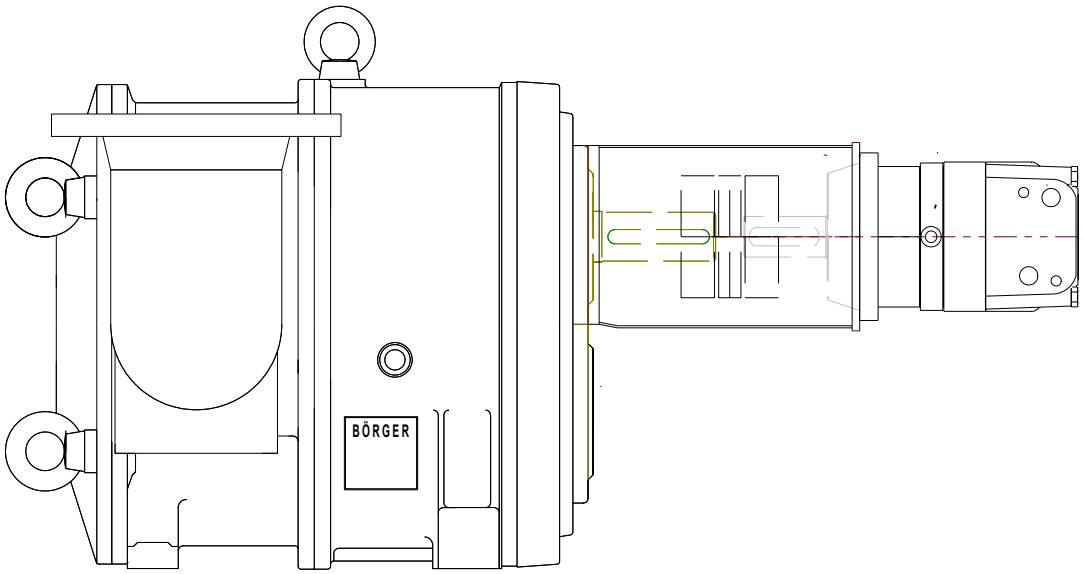
Drive as mechanically adjustable variable speed drive for adjustment of conveying capacity.

4. Helical Bevel or Worm Geared Motor



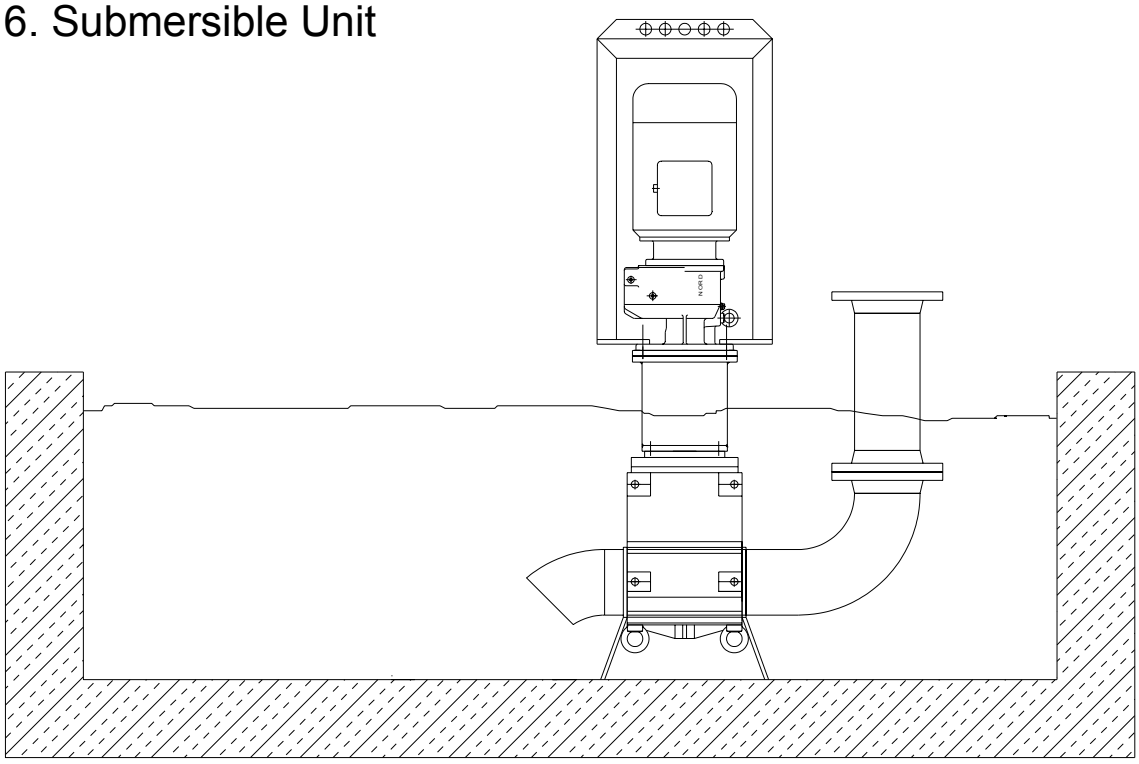
For use in extreme conditions, e.g. in a narrow tunnel, where a standard solution is not possible.

5. Hydraulic Motor



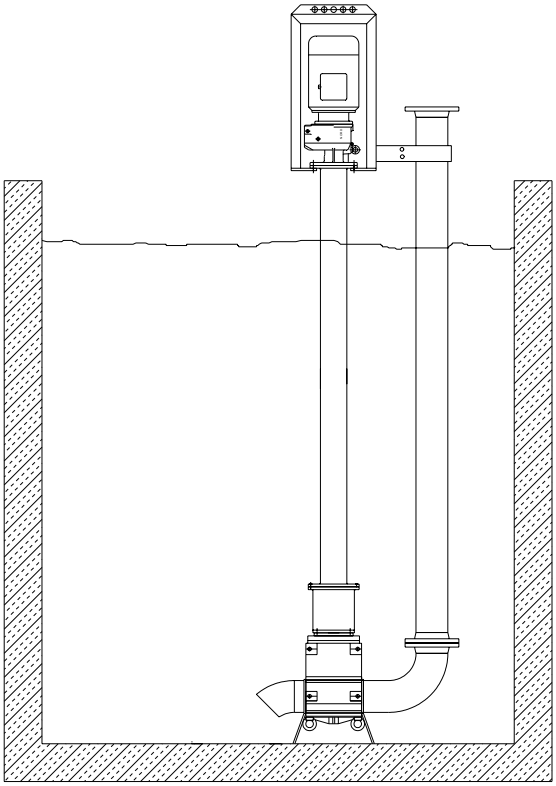
Driven by hydraulic motor, direct flanged to pump shaft.
Especially appropriate for installation on a vehicle.

6. Submersible Unit



Driven by flanged geared motor with elastic coupling in a sealed lantern. Drive in dry area.
Also available with guide rails and coupling foot.

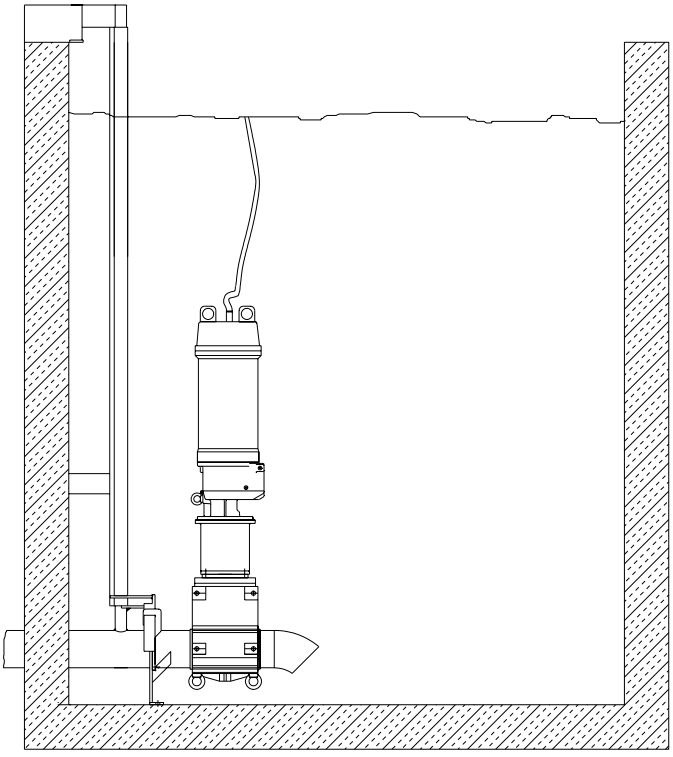
7. Submersible Pump with elongated Drive Assembly



Long-shaft-design with crane hooks and stand pipe.

Also available with guide rails and coupling foot.
.

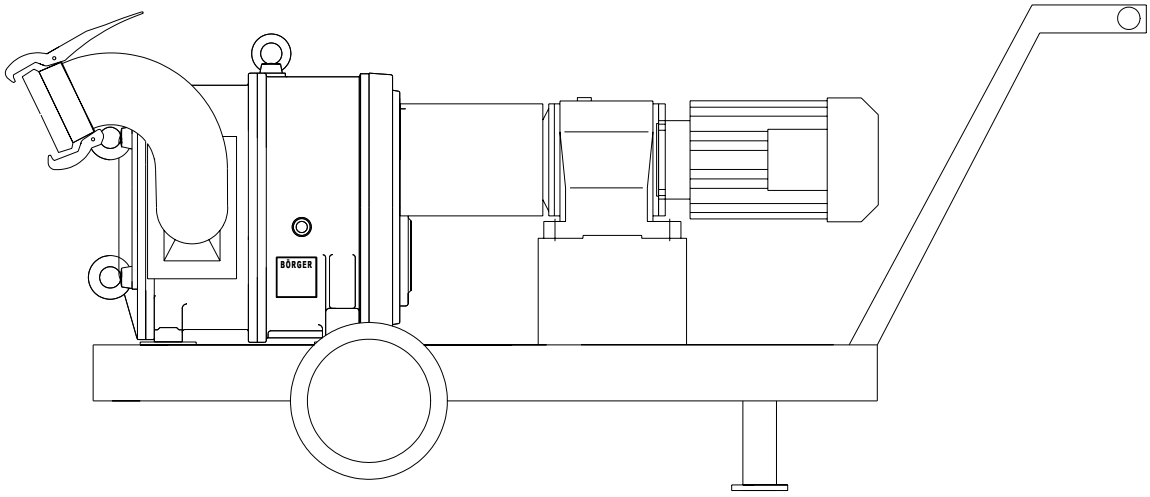
8. Submerged Aggregate



Complete aggregate submerged.

Also available with guide rails and coupling foot.

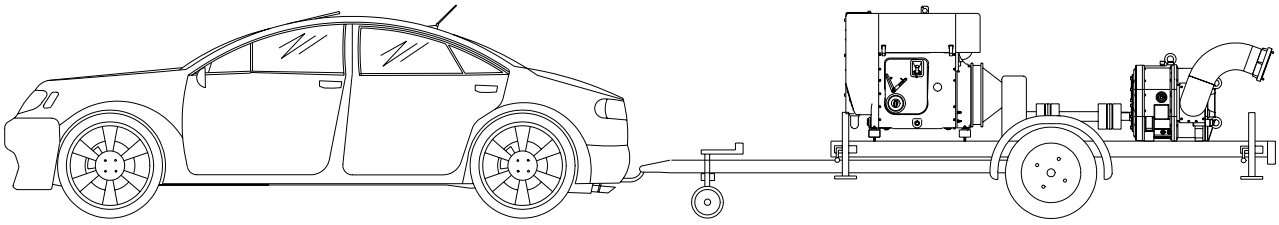
9. Pump Aggregate on Trolley



Ideal for mobile applications.

The quick couplings at suction and discharge allow easy and quickly handling with suction and pressure hoses.

10. Trailer mounted mobile Pump Unit



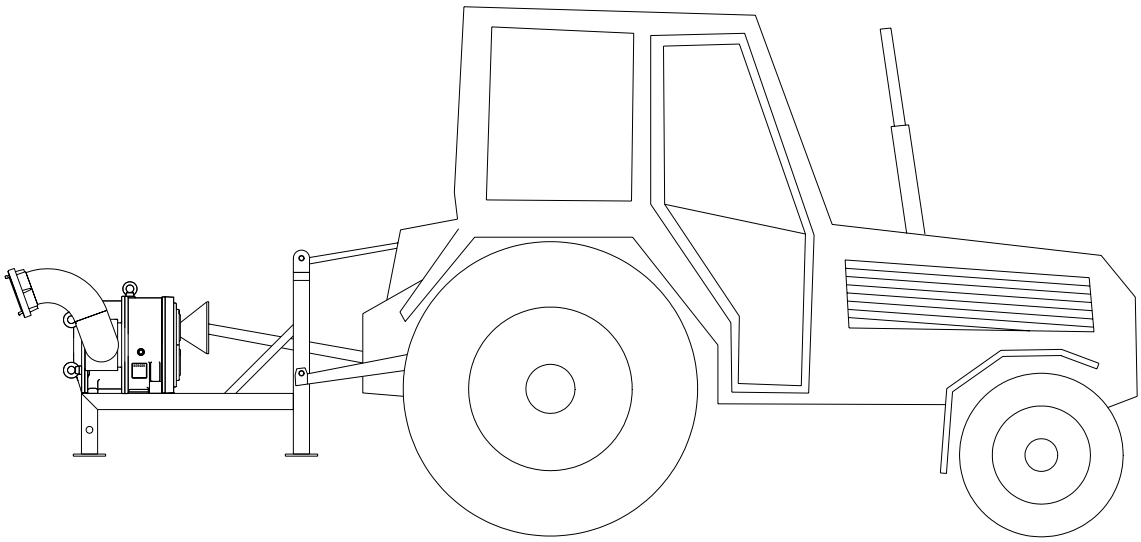
For various applications with flows from 5 to 1.050 m^3/h (20 to 4.600 USGpM).

Optional with Diesel engine or electrical drive.

The trailer can be delivered complete, as instant unit.

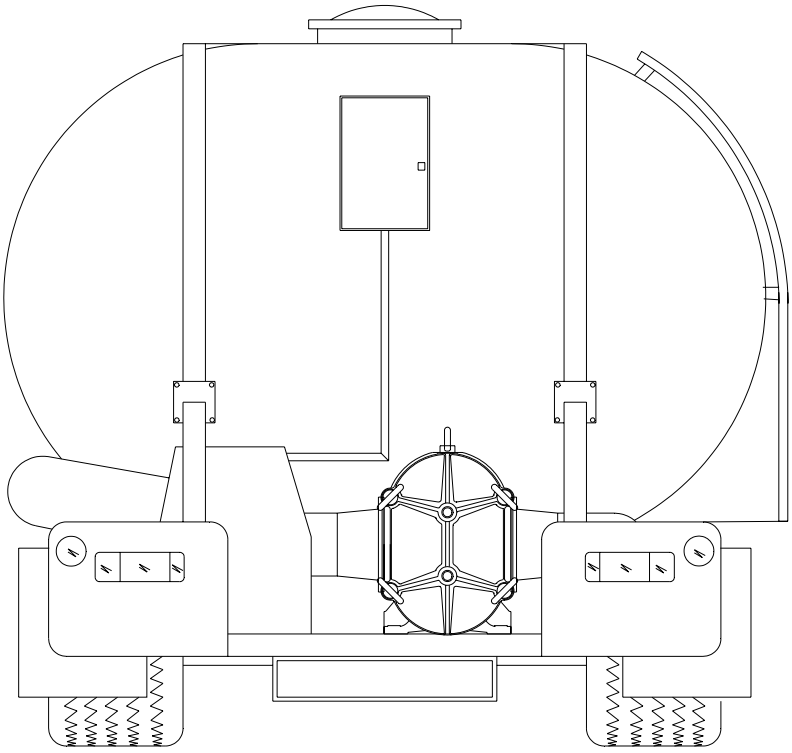
Aggregate also available with tarp cover or acoustical enclosure.

11. Tractor PTO driven Pump Aggregate



Baseframe with connector and joining coupling for fitting to tractor or Unimog.

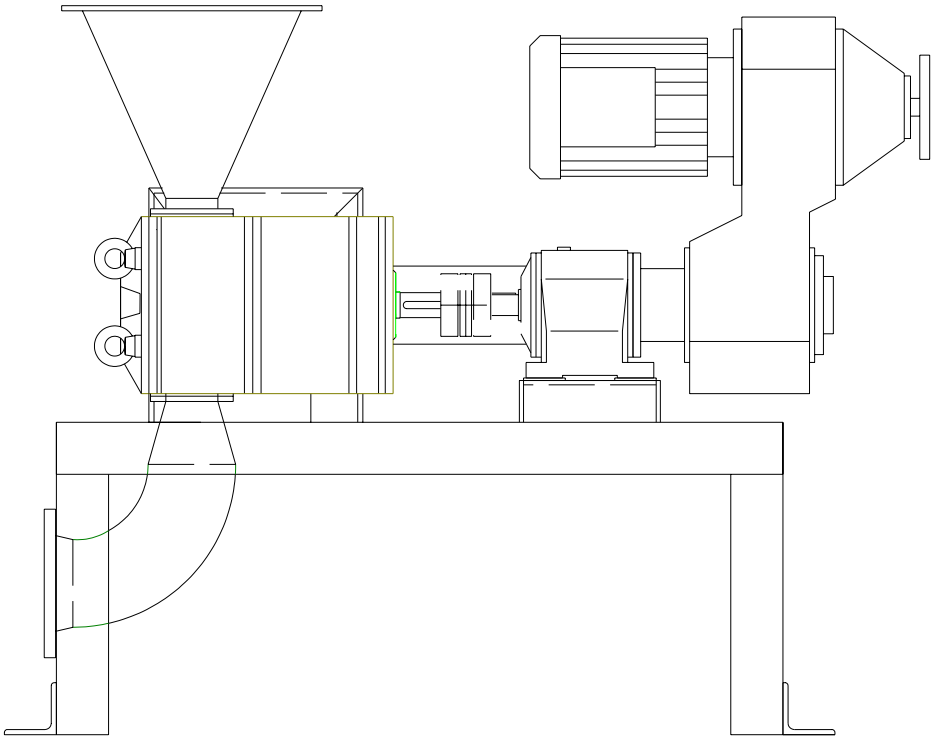
12. Pump for Road Tanker



Selfprimimg pump with conveying capacity up to 1.050 m3/h (4.600 USGpM).

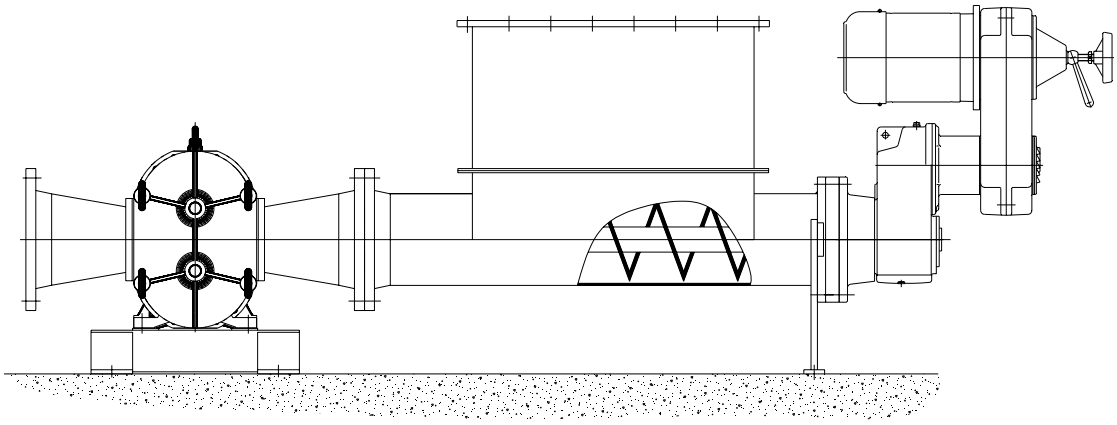
Driven by auxiliary drive or hydraulic motor.

13. Pump with Open Hopper



Horizontally fitted pump with inlet hopper for high viscous but still flowable material.

14. Pump with Auger Feed Screw



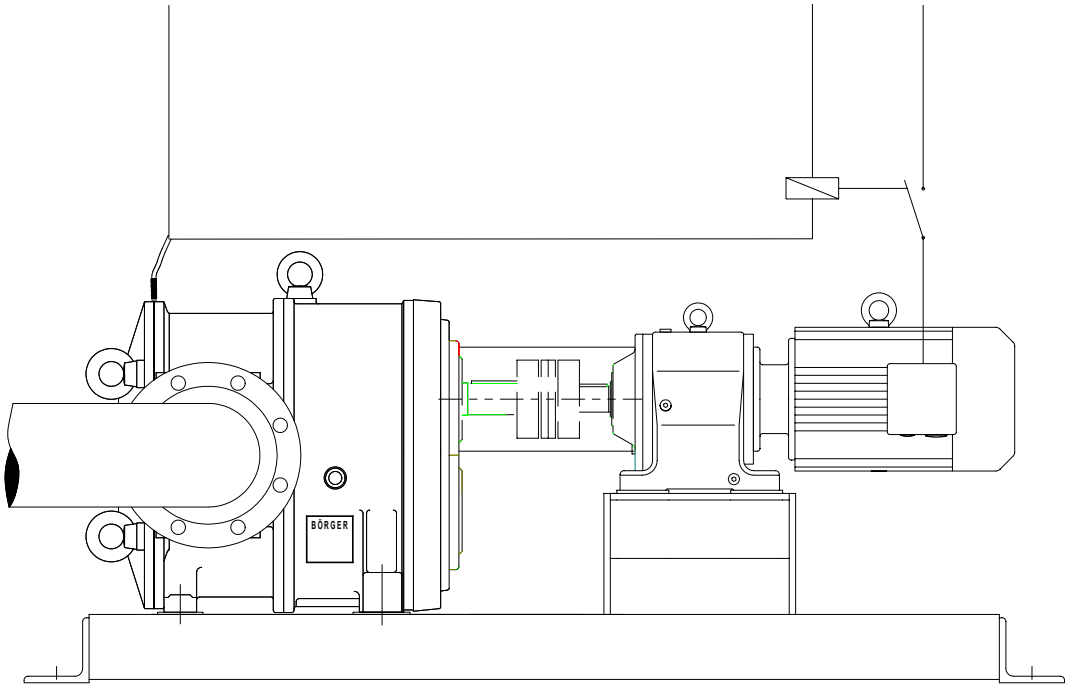
Feeding hopper device with auger feed screw for non-flowable but still pumpable products.

Auger feed screw driven by variable speed geared motor.

13

Monitoring Devices

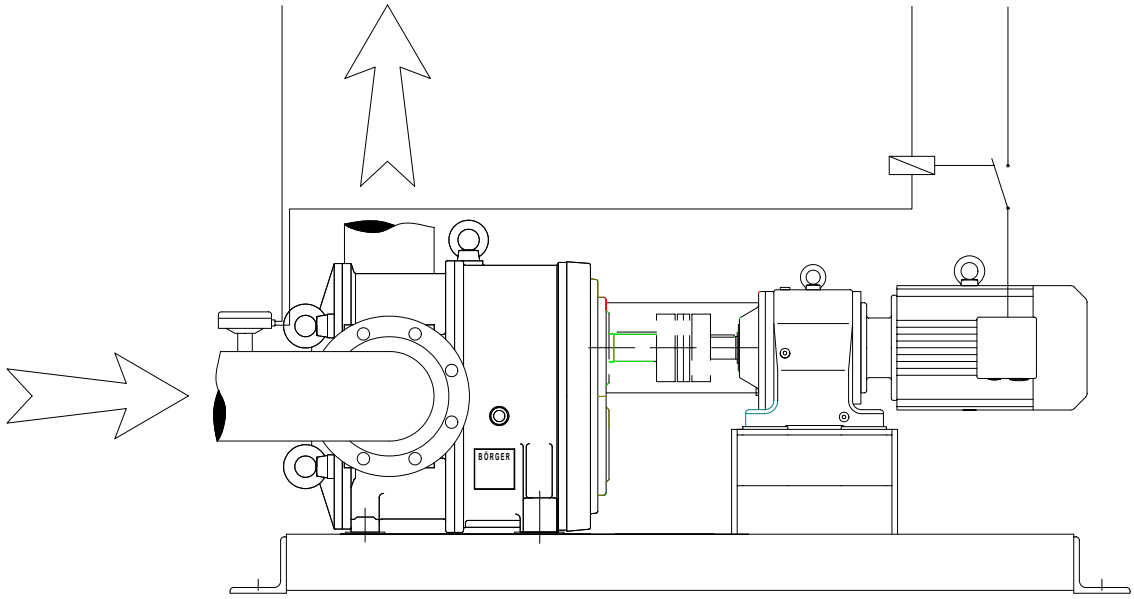
1. Thermal Dry Running Protection with Cover fitted Sensor



Dry running protection with cover fitted temperature sensor.

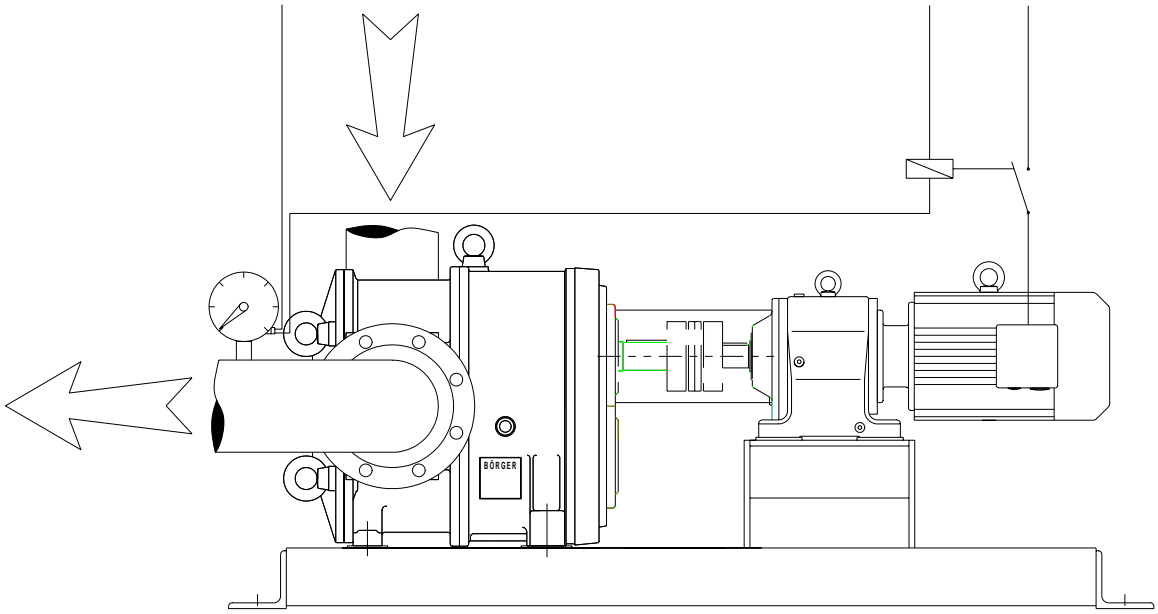
Optional with control unit for switch cabinet.

2. Dry Running Protection with Flow Sensor



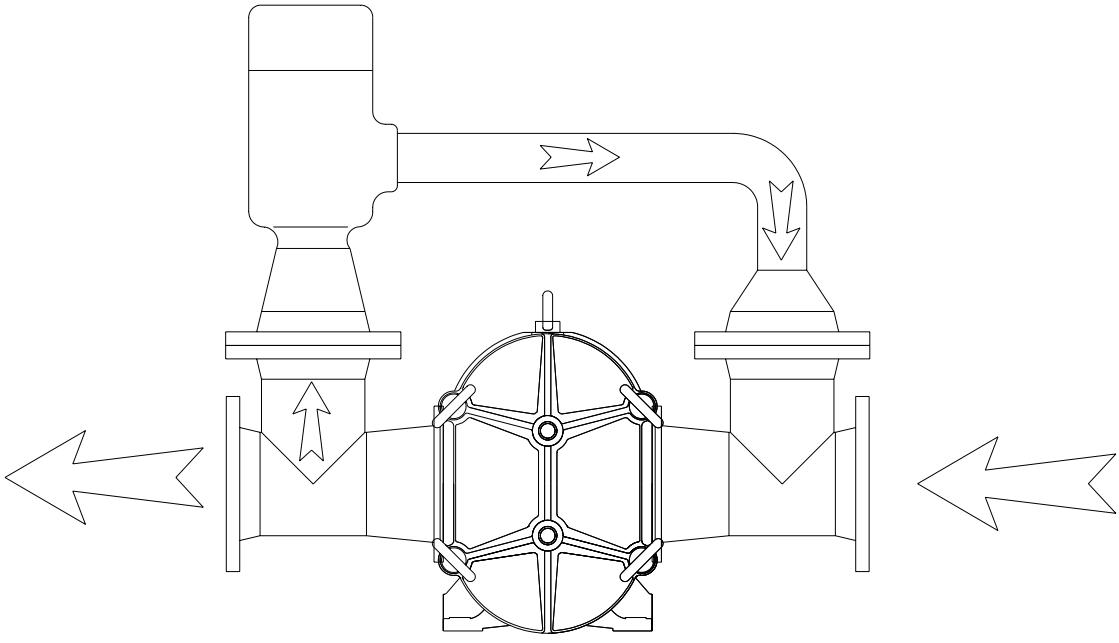
The flow sensor installed in the suction pipe detects dry running for the drive to be switched off.
Optional with control unit for switch cabinet.

3. Electrical Overpressure Protection



The pressure gauge with adjustable limit switch installed in the discharge pipe detects overpressure for the drive to be switched off.

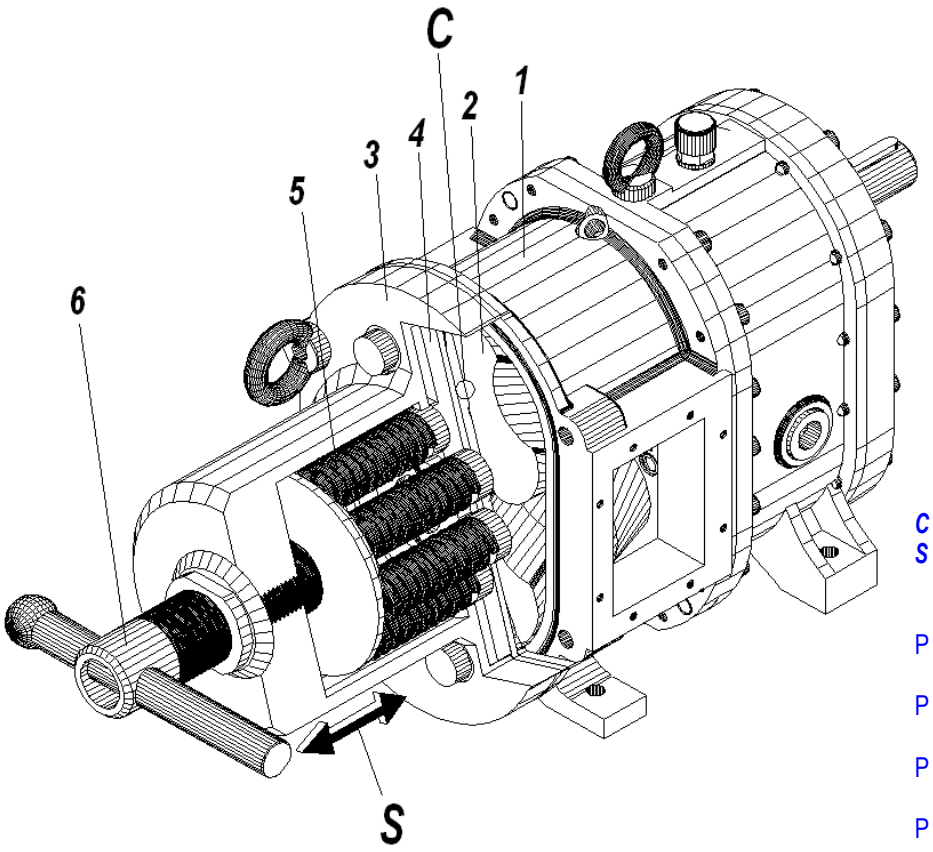
4. Mechanical Overpressure Protection, Valve with Bypass



The discharge pipe may be closed for short term without switch-off of the pump drive. While the pressure line is closed the product is conveyed through the external overpressure valve and bypass system back to the suction side.

5. VARIO-CAP

A reliable mechanical overpressure protection device, also for reversible operation.



C *Clearance*
S *Stroke*

Pos. 1 Pump Casing

Pos. 2 Rotor

Pos. 3 Cover Frame

Pos. 4 Vario Membrane

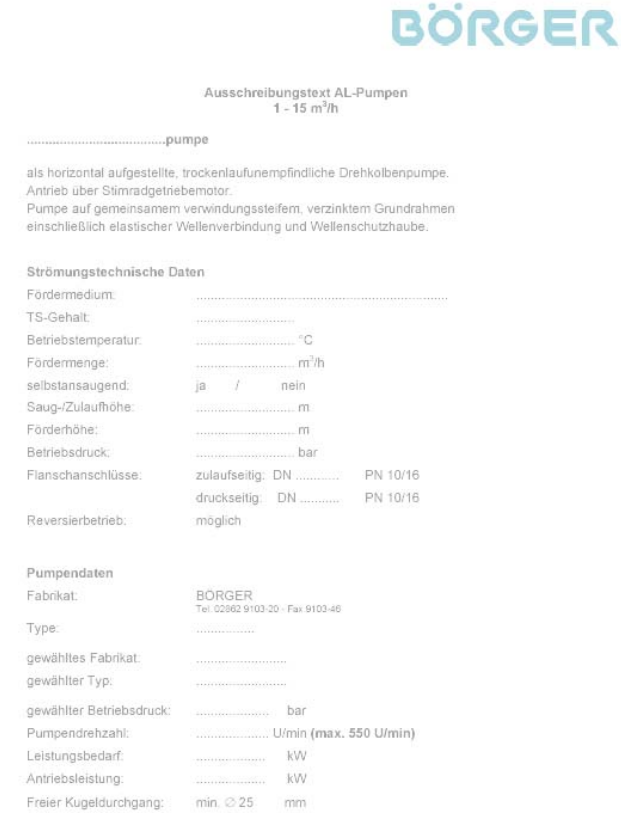
Pos. 5 Spring Package

Pos. 6 Spindle

The forces resulting from the pressure produced in the pump are acting against the forces of springs. As far as the spring load is higher, the cover is pressed to the pump casing to ensure the usual performance of the pump. In case of raising pressure above spring load the cover is moved away axially. The clearance then allows pumped product to flow back from the pressure side to the suction side of the pump which consequently reduces the performed volume. The maximal operating pressure is limited by the forces of the springs, which are adjustable. In case of closed pressure outlet the total volume flows back through the clearance between the conveying elements and the pressed off cover. With the reduction of the back pressure the gap closes and the performed volume rises.
The VARIO-CAP is sealed via an elastic diaphragm.

14

Specifications



Ausschreibungstext AL-Pumpen
1 - 15 m³/h

.....pumpe

als horizontal aufgestellte, trockenlaufunempfindliche Drehkolbenpumpe.
Antrieb über Stirnradgetriebemotor.
Pumpe auf gemeinsamem verwindungssteifem, verzinktem Grundrahmen einschließlich elastischer Wellenverbindung und Wellenschutzhaube.

Strömungstechnische Daten

Fördermedium:	.....
TS-Gehalt:	.....
Betriebstemperatur:	..... °C
Fördermenge:	..... m³/h
selbstansaugend:	ja / nein
Saug-/Zulaufhöhe:	..... m
Förderhöhe:	..... m
Betriebsdruck:	..... bar
Flanschanschlüsse:	zulaufseitig: DN ..... PN 10/16
	druckseitig: DN ..... PN 10/16
Reversierbetrieb:	möglich

Pumpendaten

Fabrikat:	BÖRGER Tel. 02862 9103-20 - Fax 9103-46
Type:	.....
gewähltes Fabrikat:	.....
gewählter Typ:	.....
gewählter Betriebsdruck:	..... bar
Pumpendrehzahl:	..... U/min **(max. 550 U/min)**
Leistungsbedarf:	..... kW
Antriebsleistung:	..... kW
Freier Kugeldurchgang:	min. ∅ 25 mm

Specification AL-Pumps
1 - 15 m3/h

.....**pump**

as Rotary Lobe Pump, horizontal fitted, not sensitive against dry running.
Driven by electrical gear motor.
Pump and drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and non sparking coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Self priming: yes / no

Suction pressure: .....mWc

Discharge pressure: .....barg

Differential pressure: .....bar

Flanges: suction flange: DN.....

pressure flange: DN.....

Reversing operation: possible

Pump data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: .....

Design pressure: .....bar

Shaft speed: .....rpm **(max. app. 550 rpm)**

Required power: .....kW

Selected power: .....kW

Free ball entrance: .....min. diam. 25 mm

Specification AL-Pumps

Design and Materials:

Pump casing:	Blockcasing, casing from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, product-loaded parts, incl. axial protective plates, changeable through the pump casing without disassembling the pump and/or pipes
Service:	suitable for MIP™, Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Lobe-form:	dual-lobe rotors, non-wetted base core from EN-GJL-250 (GG 25), entirely NBR-coated
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through pump casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-rotor-connections

Overpressure protection: Integrated overpressure relief valve (as option)

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg

Dimensions of the compl. Aggregate: x x mm

Supply of pump aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification PL-Pumps
15-75 m3/h

.....**pump**

as Rotary Lobe Pump, horizontal fitted, not sensitive against dry running.
Driven by geared motor.
Pump and drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Self priming: yes / no

Suction pressure: .....mWc

Discharge pressure: .....barg

Differential pressure: .....bar

Flanges: suction flange: DN.....

pressure flange: DN.....

Reversing operation: possible

Pump data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: .....

Design pressure: .....bar

Shaft speed: .....rpm **(max. app. 550 rpm)**

Required power: .....kW

Selected power: .....kW

Free ball entrance: .....min. diam. 40 mm

Specification PL-Pumps

Design and Materials:

Pump casing:	Blockcasing, from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, product-loaded parts, incl. axial and optional radial liners, replaceable through the casing without disassembling the pump and/or pipes
Service:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Lobe-form:	dual-lobe rotors, non-wetted base core from EN-GJL-250 (GG 25), entirely NBR-coated, lobes readjustable: yes / no / as option or helical screw lobe form for pulsation free operation (optional)
Shafts:	not wetted by pumped fluid, but quench-oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through pump casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-rotor-connections

Overpressure protection: Integrated overpressure relief valve (as option)

Drive: **helical geared motor**

Make: .....

Type: .....

Output power: .....kW

Output speed: .....rpm

Voltage: V

Frequency: .....Hz

Enclosure: .....IP 55

Isolation class: .....F

Protection: .....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions : x x mm

Supply of pump aggregate as described before:

.....of **Price per each:.....€** **Total amount:.....€**

Specification CL-Pumps
30-150 m3/h

.....**pump**

as Rotary-Lobe-Pump, horizontal fitted, not sensitive against dry running.
Driven by geared motor.
Pump and drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Self priming: yes / no

Suction pressure: .....mWc

Discharge pressure: .....barg

Differential pressure: .....bar

Flanges: suction flange: DN.....

pressure flange: DN.....

Reversing operation: possible

Pump data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: .....

Design pressure: .....bar

Shaft speed: .....rpm **(max. app. 500 rpm)**

Required power: .....kW

Selected power: .....kW

Free ball entrance: .....min. diam. 50 mm

Specification CL Pumps

Design and Materials:

Pump casing:	Blockcasing, from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, product-loaded parts, incl. axial and optional radial liners, replaceable through the casing without disassembling the pump and/or pipes
Service:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Lobe-form:	tri-lobe rotors with pushed-on quick replaceable rubber coated tips, in helical screw design, core from EN-GJS-400 (GGG 40), tips NBR-coated (tips replaceable without disassembling of pump and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through pump casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-rotor-connections

Overpressure protection: Integrated overpressure relief valve (as option)

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of pump aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification FL- and FLA-Pumps
60-400 m3/h

.....**pump**

as Rotary-Lobe-Pump, horizontal fitted, not sensitive against dry running.
Driven by geared motor.
Pump and drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Self priming: yes / no

Suction pressure: .....mWc

Discharge pressure: .....barg

Differential pressure: .....bar

Flanges: suction flange: DN.....

pressure flange: DN.....

Reversing operation: possible

Pump data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: .....

Design pressure: .....bar

Shaft speed: .....rpm **(max. app. 450 rpm)**

Required power: .....kW

Selected power: .....kW

Free ball entrance: .....min. diam. 75 mm

Specification FL and FLA-Pumps

Design and Materials:

Pump casing:	Blockcasing, from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, product-loaded parts, incl. axial and optional radial liners, replaceable through the casing without disassembling the pump and/or pipes
Service:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Lobe-form:	tri-lobe rotors with pushed on quick replaceable rubber coated tips, in linear or helical screw design, core from EN-GJS-400 (GGG 40), tips NBR-coated (replaceable without disassembling of pump and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through pump casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-rotor-connections

Overpressure protection: Integrated overpressure relief valve (as option)

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of pump aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification XL-Pumps
100 - 1050 m3/h

.....**pump**

as Rotary-Lobe-Pump, horizontal fitted, not sensitive against dry running.
Driven by geared motor.
Pump and drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Self priming: yes / no

Suction pressure: .....mWc

Discharge pressure: .....barg

Differential pressure: .....bar

Flanges: suction flange: DN.....

pressure flange: DN.....

Reversing operation: possible

Pump data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: .....

Design pressure: .....bar

Shaft speed: .....rpm **(max. app. 400 rpm)**

Required power: .....kW

Selected power: .....kW

Free ball entrance: .....min. diam. 95 mm

Specification XL-Pumps

Design and Materials:

Pump casing:	Blockcasing, from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, product-loaded parts, incl. axial and optional radial liners, replaceable through the casing without disassembling the pump and/or pipes
Service:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Lobe-form: face	dual-lobe rotors in screwed geometry with especially large sealing for pulsation reduced operation, entirely NBR coated.
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through pump casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-rotor-connections

Overpressure protection: Integrated overpressure relief valve (as option)

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of pump aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification HAL-Multicrusher
up to 10 m3/h

Macerating unit for chopping solids in fluids

as dual shafted, low speed, high torque grinder, not sensitive against dry running.
Driven by electrical gear motor.
Complete with drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and non sparking coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Inlet pressure: .....mWc

Flanges: inlet flange: DN.....

outlet flange: DN.....

Technical data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: HAL 50

Design pressure: .....bar

Shaft speed: .....rpm

Required power: .....kW

Selected power: .....kW

Specification HAL Multicrusher

Design and Materials:

Pump casing:	in Block-construction, wetted casing from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces all product-loaded parts, incl. axial protective plates, replaceable through the casing without disassembling the machine and/or pipes
Service:	suitable for MIP™, Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Cutting elements:	cutting wheels and counter knifes 4 mm, hardened steel 1.2379 (easily replaceable without disassembling of machine and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through wetted casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-connections

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg

Dimensions of the compl. Aggregate: x x mm

Supply of Multicrusher aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification HPL Multicrusher
up to 60 m3/h

Macerating unit for chopping solids in fluids,

as dual shafted, low speed, high torque grinder, not sensitive against dry running.
Driven by geared motor.
Complete with drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Inlet pressure: .....mWc

Flanges: inlet flange: DN.....

outlet flange: DN.....

Technical data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: HPL 200

Design pressure: .....bar

Shaft speed: .....rpm

Required power: .....kW

Selected power: .....kW

Specification HPL Multicrusher

Design and Materials:

Wetted casing:	in Block-construction, wetted casing from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, all product-loaded parts, incl. axial protective plates, replaceable through the casing without disassembling the machine and/or pipes
Maintenance:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Cutting elements:	cutting wheels and counter knifes 8 mm, hardened steel 1.2379 (easily replaceable without disassembling of machine and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through wetted casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-connections

Drive: helical geared motor

Make: .....

Type: .....

Output power: .....kW

Output speed: .....rpm

Voltage: V

Frequency: .....Hz

Enclosure: .....IP 55

Isolation class: .....F

Protection: .....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of Multicrusher aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification HCL Multicrusher
up to 120 m3/h

Macerating unit for chopping solids in fluids,

as dual shafted, low speed, high torque grinder, not sensitive against dry running.
Driven by geared motor.
Complete with drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Inlet pressure: .....mWc

Flanges: inlet flange: DN.....

outlet flange: DN.....

Technical data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: HCL 390

Design pressure: .....bar

Shaft speed: .....rpm

Required power: .....kW

Selected power: .....kW

Specification HCL Multicrusher

Design and Materials:

Wetted casing:	in Block-construction, wetted casing from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, all product-loaded parts, incl. axial protective plates, replaceable through the casing without disassembling the machine and/or pipes
Maintenance:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Cutting elements:	cutting wheels and counter knifes 8 mm, hardened steel 1.2379 (easily replaceable without disassembling of machine and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through wetted casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-connections

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of Multicrusher aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification HFL Multicrusher
up to 200 m3/h

Macerating unit for chopping solids in fluids,

as dual shafted, low speed, high torque grinder, not sensitive against dry running.
Driven by geared motor.
Complete with drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Inlet pressure: .....mWc

Flanges: inlet flange: DN.....

outlet flange: DN.....

Technical data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: HFL 776

Design pressure: .....bar

Shaft speed: .....rpm

Required power: .....kW

Selected power: .....kW

Specification HFL Multicrusher

Design and Materials:

Wetted casing:	in Block-construction, wetted casing from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, all product-loaded parts, incl. axial protective plates, replaceable through the casing without disassembling the machine and/or pipes
Maintenance:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Cutting elements:	cutting wheels and counter knifes 10 mm, hardened steel 1.2379 (easily replaceable without disassembling of machine and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through wetted casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-connections

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of Multicrusher aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification HLA Multicrusher
up to 310 m3/h

Macerating unit for chopping solids in fluids,

as dual shafted, low speed, high torque grinder, not sensitive against dry running.
Driven by geared motor.
Complete with drive fitted on common twist free baseframe (no folded plate), made from galvanised steel, incl. elastic coupling and coupling guard.

System and fluid conditions:

Fluid: .....

Solids content: .....%

Operating temperature: .....°C

Capacity: m3/h

Inlet pressure: .....mWc

Flanges: inlet flange: DN.....

outlet flange: DN.....

Technical data:

Make: BÖRGER Tel. (49)2862/9103-20, Fax. (49)2862/9103-46

Type: HLA 1540

Design pressure: .....bar

Shaft speed: .....rpm

Required power: .....kW

Selected power: .....kW

Specification HLA Multicrusher

Design and Materials:

Wetted casing:	in Block-construction, wetted casing from one piece only, made of grey cast iron EN-GJL-250 (GG 25), surface hard, protective plates at both faces, optional radial casing liners, all product-loaded parts, incl. axial protective plates, replaceable through the casing without disassembling the machine and/or pipes
Maintenance:	suitable for MIP™ Maintenance in Place, simply by opening the quick release cover with O-ring sealing
Bearings:	one side double bearings, oil bath in block-casing, lateral drain plug
Cutting elements:	cutting wheels and counter knifes 10 mm, hardened steel 1.2379 (easily replaceable without disassembling of machine and/or pipes)
Shafts:	not wetted by pumped fluid, but oil lubricated
Shaft sealing:	maintenance free single acting mechanical seals with common oil quench for both seals (grease not allowed) both seal faces Duronit V / Duronit V, identical design, replaceable through wetted casing
Sealing control:	oil filled intermediate chamber in between gear and wetted end with lateral drain plug, for quenching and monitoring the seals and for lubricating the shaft-connections

Drive:	helical geared motor
Make:	.....
Type:	.....
Output power:	.....kW
Output speed:	.....rpm
Voltage:	V
Frequency:	.....Hz
Enclosure:	.....IP 55
Isolation class:	.....F
Protection:	.....3 PTC Thermistors

Weight of the complete aggregate: kg Dimensions: x x mm

Supply of Multicrusher aggregate as described before:

.....of Price per each:.....€ Total amount:.....€

Specification Multichopper

Macerating Unit

Including debris collection area for non-cutable solids, in space saving Inline design , for fitting to pipes.

Systems Condition:

Medium:	……		
Solids Content:	……%		
Viscosity:	flowable		
Operating Temperature:	……°C		
Specific Gravity:	…… kg/dm3		
Throughput volume:	…….. m^3/h		
Inlet Pressure:	……..mWs		
Flange Connections:	Inlet:	DN 150	PN 10
	Outlet:	DN 150	PN 10

Macerator Data:

Make:	BÖRGER Tel. +49 / 2862 9103-20 - Fax 9103-46
Type:	Multichopper
Size and Type:	.....
Shaft Speed:	..... U/min
Required Power:	..... kW
Selected Power:	..... kW

Specification Multichopper

Design :

- 1 cutter plate
- 2 of knifeheads with each 3 knifes, adjustable from outside via one central screw
- 6 cuts per revolution
- Each knife can be used 4 times by simply reversing
- Easy and simply opening via quick release cover
- Flange connections: DN 150 PN 10/16
- Draining and cleaning port

Materials :

- Casing and cover from steel, painted
- Cutter casing: Steel 1.0037
- Cutter plate and knifes: Hardened steel 1.2379
- Shaft seal: Mechanical seal Duronit V with quench and optical control
- O-Rings: NBR
- Flange connections: Steel painted

Drive:

Drive:	Parallel shaft geared motor	
Make:	.....	
Type:	.....	
Power:	.....	kW
Shaft speed:	.....	U/min
Voltage:	.....	V
Frequency:	50	Hz
Enclosure:	IP	55
Temperature class:	F	
Protection:	3 PTC Thermistors	

Total weight of the aggregate: ..... kg

Dimensions of the aggregate (L x W x H): ..... x ..... x ..... mm

Aggregate to be delivered as described:

..... Units Price each: ..... € Price total: ..... €

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Inquiry Form and Brochures

Datum: _____

ANFRAGE FAX: +49 (0) 28 62 / 91 03 – 46 E-Mail: info@boerger.de

☐ **Wir bitten um weitere technische Informationen über** _____
☐ **Wir bitten um Rückruf unter Tel.:** _____
☐ **Wir bitten um einen Besuch (nach Terminabsprache)**
☐ **Wir bitten um ein kostenloses, unverbindliches Angebot, wie folgt:**

_____ **Stk. BÖRGER Drehkolbenpumpe(n) /Unihacker für:**_____

Fördermenge: min:_____m³/h max: _____ m³/h überwiegend:_____m³/h
Förderhöhe: _____ mWs Druck: _____ bar
selbstansaugend: _____ m Vordruck: _____ m NPSH vorh.:_____ m
Fördertemperatur: _____ °C Viskosität: _____ mPas/cP pH-Wert:_____
Dichte: _____ kg/m³ Feststoffe: _____% Volumen/Gewicht
Einsatz je Tag: ca. _____ Std. Art der Feststoffe:_____
Rohranschlüsse Saugseite: DN_____ Sauglänge:_____ m ges. Druckseite: DN____
gewünschte Werkstoffe:_____
Trockenlaufschutz: ☐ Nein ☐ Ja Fabrikat:_____
Überdrucksicherung: ☐ Nein ☐ Ja Fabrikat:_____

ANTRIEB:
☐ ohne Antrieb
☐ Stirnradgetriebemotor
☐ mit Frequenzumrichter
☐ Verstellgetriebemotor:
☐ mit Handverstellung
☐ mit Servomotor
☐ Hydraulikmotor
☐ mobile Pumpe in folgender Ausführung:
Antrieb per ☐ Dieselmotor ☐ Elektromotor

MOTORDATEN:
Spannung: _____V
Frequenz: _____Hz
Ex-Schutz: ☐ Nein ☐ Ja:_____

Fahrgestell als ☐ PKW-Anhänger ☐ Handwagen

BÖRGER®
Rotary Lobe Pump
Chopping Technology

SENDER: _____

_____

_____

Börger GmbH
Benningsweg 24
46325 Borken-Weseke
Germany

Contact : _____
Telephone: _____
Fax: _____
Date: _____

I N Q U I R Y

FAX: +49 (0) 28 62 / 91 03 – 46
E-Mail: info@boerger-pumps.com

☐ **Please send more technical information about** _____
☐ **Please call back to Tel.:** _____
☐ **Please visit us (upon appointment)**
☐ **We ask for a free of cost, non obligatory quote:**

_____ **of BÖRGER Rotary Lobe Pump (s) / Multicrusher for:**_____

Conv. Capacity: min:_____m³/h max: _____ m³/h Duty Point:_____m³/h
Head: _____ mWc Pressure: _____ bar
Self priming: _____ m Flooded: _____ m NPSH avail.:_____ m
Fluid Temperature: _____ ºC Viscosity: _____ mPas/cP pH-Value:_____
Spec. Gravity: _____ kg/m³ Solids: _____% Volume / Weight
Operating Time / Day: app._____ h Kind of Solids:_____
Pipe Connections Suction: DN_____ Suction Lenght:_____ m total Discharge: DN_____
Required Materials:_____
Dry running Protection: ☐ No ☐ Yes Make:_____
Overpressure Protection: ☐ No ☐ Yes Make:_____

DRIVE:

☐ without Drive
☐ Geared Motor
☐ with Frequency Inverter
☐ Variable Speed Geared Motor:
☐ with Handwheel Adjustment
☐ with Servomotor
☐ Hydraulic Motor
☐ mobile Pump with:
Drive as ☐ Diesel Motor ☐ Electric Motor fitted on ☐ Car Trailer ☐ Hand Trolley

MOTOR DATA:

Voltage: _____V
Frequency: _____Hz
Ex-Proof: ☐ No ☐ Yes:_____

OTHERS / REMARKS:_____